DOCUMENT RESUME

ED 024 785 08 VT 005 768

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An Introduction to Teaching Vocational Technical Education, a Pre-Service Teacher Training Course for Potential Vocational Teachers in Minnesota. Final Report, Appendix A.

Minnesota State Dept. of Education, St. Paul. Vocational Education.
Spons Agency- Office of Education (DHEW), Washington, D.C.
Bureau No- BR-5-0168
Pub Date Jul 68
Contract- OEC-6-85-051
Note- 372p.
EDRS Price MF-$1.50 HC-$18.70
Descriptors- *Curriculum Guides, *Educational Methods, *Educational Practice, *Preservice Education, Teacher Education, Tests, Video Tape Recordings, Vocational Education, *Vocational Education Teachers

This appendix to VT 005 767 is a curriculum guide for a 24 hour preservice course, utilizing film, video tape, and seminar-discussion, for vocational teachers prior to initial teaching. The contents include: (1) course objectives, (2) 12 unit outlines, (3) instructional and resource materials list for each unit, (4) a list of leader's and student's activities, (5) unit exams and answer keys, and (6) audio and video scripts for each unit. (EM)

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Appendix A

BR 5-0168
PA-08

AN INTRODUCTION TO TEACHING

VOCATIONAL

TECHNICAL EDUCATION

THRU VIDEO TAPE AND TELEVISION

ED0 24785

A PRE-SERVICE TEACHER TRAINING COURSE FOR POTENTIAL
VOCATIONAL TEACHERS IN MINNESOTA

VT005768

Vocational/Technical Division
State Department of Education
St Paul, Minnesota

Unit 1

Teaching in Vocational Technical Schools

Code XXIX-B-61

TEACHER'S GUIDE

FOR

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING

FOR

A twenty-four clock hour pre-service
film, video tape and seminar-discussion vocational
and technical teacher education course as part of
USOE, 4C, Development Project No. OE6-85-051

BY

The staff of the Department of Trade and Industrial Education
University of Minnesota, Minneapolis, Minnesota 55455

FOR

The U.S. Office of Education and the State Director of
Vocational Education, Minnesota State Department of Education, Saint Paul, Minnesota 55101

FOREWORD

One of the most challenging problems associated with vocational and technical education in Minnesota today involves the identification, preparation and retention of sufficient numbers of competent instructors to man the teaching positions. To extend and expand these program grams and simultaneously increase their quality depends solely upon well prepared teachers.

The following project of preparing vocational teachers through the use of educational television was undertaken as one attempt to use this media for the important task of teacher education. The project itself was underwritten by Federal monies under the Special Grants portion of Section 4(c) of the Vocational Education Act of 1963.

Mr. S. K. Wick, State Supervisor of Vocational Education for Minnesota, conceived of the project initially and inaugurated discussions of it as a potential activity for staff members of the Department of Industrial Education. The actual proposal was developed and given leadership by Dr. William A. Kavanaugh. Since all staff of the Department are qualified vocational teacher trainers, they were enlisted almost immediately to prepare lesson materials for the twelve teacher training presentations. In effect, the television series became a project of the Department of Industrial Education staff.

The instructional materials which follow have been developed for use in conjunction with the filmed presentations as a "complete package" for beginning vocational teacher training. Thus, it should be possible for a director, coordinator or other qualified person to employ all twelve complete lessons and conduct the initial twenty-four clock hours of training.

At this point in time, the entire project is considered experimental in nature and subject to revision and improvement as the need arises. Likewise, there is no clear-cut evidence that this approach is superior to former practices or less effective. Sometime in the future, we expect to conduct research on this aspect of the project.

Since the twelve lessons in the series are strictly survey in nature and do not provide "depth" on any one topic, all presenters are convinced that instructors trained in this manner must follow up immediately with regular, organized courses. These courses are offered on the University Campus and in some cases are given out-State through extension. Since the current requirement stands at 190 clock hours of preparation for certification, vocational teachers must meet the requirement in this way.

Dr. Howard F. Nelson, Chairman
Industrial Arts Department
March, 1967

COURSE INTRODUCTION

The following twelve units of instruction have been developed as a complete package of materials suitable for the initial preparation of an occupationally competent person who wishes to meet certification requirements for vocational teaching.

As now constituted, these materials provide an overview of the job of teaching and a modest amount of insight into the many facets of an instructor's responsibility. As an overview, these materials must be viewed as a basic introduction to teaching and in no sense, a sufficient preparation for the profession of teaching.

Much dependence has been placed upon the high caliber of leadership exercised by the seminar leader under whose direction meaningful discussions will serve to round out the film presentations. Active participation of all students taking the course will further insure its success. It would be expected that these twelve lessons would not be employed except under the direct supervision of an expert, well qualified seminar leader.

As now written, these materials contain twelve, thirty-minute film presentations by expert teacher trainers, each followed by a ninety-minute seminar, discussion period. Each unit contains tests of understanding, answers and answer sheets as well as a suggested topical outline to be used by the seminar leader and participants. Unit I will provide a course syllabus to give guidance and direction to all subsequent units, and throughout, there are numerous opportunities for active participation of students.

Persons who are highly skilled in almost any field of business, trades and industry, and related fields who can show a minimum of at least three years of current work experience on the job, and who wish to become certified for teaching in these programs, should be interested in taking this course. Specific information concerning where and when this series of lessons will be given should be obtained from the State Department of Education, the Vocational Education Division.

COURSE OBJECTIVES

The general and guiding goals for attainment in this course are stated here in broad form and clarified into specific course content in each of the course units.

A prospective vocational or technical school instructor completing this course should:

- Understand and be able to use vocational and educational terminology common to the work of the beginning instructor. (Emphasis, Units 1-12)
- Develop first appreciations of the power and efficiency of sound educational principles and practices in vocational and technical school teaching. (Emphasis, Units 1-12)
- Understand the place and nature of vocational and technical school programs in the total program of public education. (Emphasis, Unit 1)
- Understand the basic elements and related practices of an Instructional Analysis. (Emphasis, Unit 2)
- Understand the principles and practices underlying effective organization of teaching content. (Emphasis, Unit 3)
- Understand the principles of planning and organizing the elements of a lesson. (Emphasis, Unit 4)
- Know some basic principles and practices in teaching for understanding. (Emphasis, Unit 5)
- Know some common methods in teaching for motor-skill development. (Emphasis, Unit 6)
- Know some common types of instructional aids and their place in the teaching and learning process. (Emphasis, Unit 7)
- Understand the techniques used in making and using projected instructional aids, (Emphasis, Unit 8)
- Understand the nature and process of evaluating instructional outcomes. (Emphasis, Unit 9)
- Understand common evaluative instruments for evaluating instructional outcomes. (Emphasis, Unit 10)
- Understand and be able to judge techniques for laboratory and classroom management. (Emphasis, Unit 11)
- Be able to plan a program of self evaluation and self improvement for vocational teaching as a career. (Emphasis, Unit 12)

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

COURSE UNITS

UNIT	UNIT TITLE	INSTRUCTOR
1	Teaching in Vocational-Technical Schools	Dr. Howard F. Nelson
2	Analyzing for Instruction	Dr. William A. Kavanaugh
3	Organizing Course Components	Dr. William A. Kavanaugh
4	Planning the Lesson	Dr. Jerome Moss, Jr.
5	Teaching for Understanding	Dr. Jerome Moss, Jr.
6	Teaching for Motor-Skill Development	Dr. David Pucel
7	Teaching with Instructional Aids	Dr. Neville P. Pearson
8	Developing Instructional Aids	Dr. Neville P. Pearson
9	Evaluating Instructional Outcomes	Dr. Robert R. Randleman
10	Developing Evaluative Materials	Dr. Robert R. Randleman
11	Managing Teaching-Learning Facilities	Dr. Robert R. Randleman
12	Planning your Teaching Career	Dr. Howard F. Nelson

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

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TEACHER'S GUIDE

FOR

TEACHING IN THE VOCATIONAL-TECHNICAL SCHOOLS | UNIT 1

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining
filmed presentations and seminar discussions
designed to provide twenty-four clock hours
of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 1 INTRODUCTION

Unit I, "Teaching in Vocational-Technical Schools", the first of twelve lessons for the initial preparation of vocational teachers, has been developed to provide an overview for the whole series.

The main purpose of this first unit is to explain what the whole series is about, why we have included certain units of instruction, what students are expected to do and what should happen next for them in the process of teacher education.

The seminar-discussion which follows this presentation should be devoted to an extended explanation of all specific points or issues raised during the thirty minute film. Since no topic was given complete coverage during the over-view presentation, many specific questions would be expected during the seminar. Further clarification of these is an important activity for these sessions and for this reason, the film should always be followed by the seminar.

And, finally, since very little of the philosophy of vocational education can be covered in the regular presentations, the seminars provide an excellent opportunity for an initial discussion of philosophy throughout all seminars. Let's restate one thought from this presentation:

> A teacher of vocational education should take a student where he finds him, lead him to want to be what he ought to be, lead him to want to do what he ought to do, lead him to learn what he ought to learn, and then send him out to the world of work with all the necessary competencies which will enable him to compete successfully with his peers.

UNIT 1 OBJECTIVES

A student completing this unit should:

(1) Understand the general terminology used in vocational education.
(2) Understand vocational teacher preparation procedures and the requirements for certification; initial and continued.
(3) Understand the nature of the course; its purposes, units of instruction and expected outcomes.
(4) Begin planning for additional, formal vocational teacher education.

STUDENTS WILL UNDERSTAND (cognitive) Principles, Concepts, Generalizations

1. Nature of Course
   - A. Overview, Orientation
   - B. Experimental
   - C. Developmental
   - D. Instructive
   - E. For Certification
2. Participant Eligibility
   - A. Industrial Experience
   - B. Interest in Vocational Teaching
   - C. Employability by Vocational Schools
3. Professional Vocational Teacher Education Responsibilities
   - A. Area Vocational Schools
   - B. Vocational Division, State Department of Education
   - C. University of Minnesota Minneapolis and Duluth
4. Vocational Teacher Certification
   - A. Six-Hour Requirement
   - B. First Course - 18 to 24 Clock Hours
   - C. 192 Clock Hour Requirement
   - D. Continuing Certification
5. Organization of the Course
   - A. 24 Clock Hours or 2 Quarter Credit Hours
   - B. 12 Course Units
   - C. 12 Technical, 30-Minute TV Tapes and Sound Films
   - D. 12-90 Minute Seminar Discussions
   - E. 11 Unit Tests
   - F. Comprehensive Final Test
6. Area Vocational-Technical Schools
   - A. Number and Location
   - B. Comprehensive Offerings
   - C. An Appraisal of These Schools
   - D. Comparison with Other States
7. Course Content Areas
   - A. Introduction
   - B. Planning for Teaching
   - C. Teaching Methods
   - D. Learning and Evaluation
   - E. Management
   - F. Vocational Teaching Career
8. Course Unit Titles and Overview
   - A. (1) Teaching in Vocational-Technical Schools
   - B. (2) Analyzing for Instruction
   - C. (3) Organizing Course Components
   - D. (4) Planning the Lesson
   - E. (5) Teaching for Understanding
   - F. (6) Teaching for Motor-Skill Development
   - G. (7) Teaching with Instructional Aids
   - H. (8) Developing Instructional Aids
   - I. (9) Evaluating Instructional Outcomes
   - J. (10) Developing Evaluative Materials
   - K. (11) Managing Teaching-Learning Facilities
   - L. (12) Planning your Teaching Career

UNIT 1	LESSON MATERIALS

A. Unit 1 Film, Teaching In Vocational-Technical Schools

B. Script of Film

C. Unit Test

D. Unit Test Answer Sheet

E. Unit Test Key

F. Overview Chart Showing Twelve Course Units

G. Map Showing Minnesota Area Vocational-Technical Schools

H. Syllabus for Entire Series

I. Introductory Materials and Assignments for Unit II.

UNIT 1 SUGGESTED METHOD OF APPROACH*

DISCUSSION LEADER	STUDENT ACTIVITY
1. Use the essence of the "Introduction" to this unit to "set the stage" with participants for viewing the film. The discussion leader should remember that students are all new to vocational teacher training and need an orientation to it. While the film treats this topic, students need to be made ready for the film itself.	1. Raise whatever questions as are relevant at this time.
2. Arrange for film viewing, either individually or in group. In so doing, make a lesson out of the correct use of the film so that students see how a film should be shown.	2. View film, "Teaching in Vocational-Technical Schools"
3. Give test number one at completion of film. (Copies of test and answer sheets duplicated earlier. Sample included in unit appendix.) Advise students to mark only answer sheets so test forms can be used again.	3. Complete test answer sheet. (No time limit.)
4. Provide test answers.	4. Correct answer sheet. Mark test scores on progress chart by code number provided by instructor.

*The same approach can be used for one student or a group of students. While this approach is a suggested one, it is suggested also that the teacher for whom this content is new follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 1 | SUGGESTED METHOD OF APPROACH

Continued--

DISCUSSION LEADER	STUDENT ACTIVITY
5. Initiate discussion from the student answer sheets.	5. Return answer sheets to discussion leader.
6. Raise topics of industrial experience, interest in teaching and employability by schools for discussion.	6. Each participant might review his qualifications under these suggested topics for whole group.
7. Introduce topic of University's involvement in vocational teacher training. Discuss Vocational Division's function in certification.	7. Raise relevant questions.
8. Focus on clock-hour requirements for initial, two-year and continued certification.	8. Raise relevant questions.
9. Review for students what they will receive from this first unit of instruction.	
10. Describe in some detail the Minnesota Area School System.	10. Students refer to brochure, "Minnesota's Area Vocational-Technical Schools".
11. Discuss major, large units of instruction included in Unit 1 and how they interrelate.	
12. Go over separate units through no. 12 and explain again their reasons for inclusion.	
13. If time permits, discuss some of the philosophy of vocational education.	
14. Distribute course syllabus and indicate its major elements.	
15. Introduce Unit II; what it will cover and who will present it. Distribute course syllabus and indicate its major elements.	

UNIT 1	UNIT RESOURCE APPENDIX TEACHING IN THE VOCATIONAL-TECHNICAL SCHOOLS

RESOURCE MATERIALS

A. **Unit Test**

B. **Unit Answer Sheet**

C. **Unit Test Answer Key**

D. **Film Script**

E. **Film Summary for Unit 2**

F. **Hand-Out-Chart of Course Units**

G. **Hand-Out-Map - Minnesota Area Vocational Schools**

Appendix A

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT 1 UNIT EXAMINATION
TEACHING IN THE VOCATIONAL-TECHNICAL SCHOOLS

Directions: Each of the incomplete statements listed below is followed by several words or phrases. From these words or phrases, choose the one which, when added to the incomplete statement, gives the best, or correct, meaning. Blacken out the space on the answer sheet which corresponds to the correct response.

1. The preparation of vocational teachers like yourselves is a State Plan major responsibility of:
   A. all colleges and universities in Minnesota
   B. the University of Minnesota and branches.
   C. the University plus St. Cloud State and Mankato State.
   D. whichever university that has the necessary instructional staff.
2. The preparation of vocational teachers like yourselves may be most effectively done by:
   A. educational television.
   B. providing for small group, personal contact with the instructor
   C. combining these two.
   D. either one with no proof of which is best.
3. Initial certification for vocational teaching requires:
   A. twelve, half-hour sessions of instruction.
   B. twenty-four clock hours of instruction.
   C. twelve, half-hours of instruction plus twelve hours of seminar meetings.
   D. none of these.
4. In order to qualify for certification, a person may:
   A. develop the skilled competence at any time.
   B. develop the skilled competence while obtaining the preparation.
   C. take preparation for teaching after attaining trade or occupational competence.
   D. discontinue development of skilled competence after obtaining the teacher training.
5. In taking this teacher training course, you can expect to:
   A. receive instruction in your trade or occupational area.
   B. make changes in your trade or occupational competence.
   C. take what you know and can do and add more to the "know" of your trade or occupation.
   D. add teaching competence to your occupational competence.
6. Certification for vocational teaching comes under the:
   A. Vocational Division, State Department of Education.
   B. State Department of Education, Certification Division.
   C. University of Minnesota, Placement Division, Department of Industrial Education.
   D. Vocational Certification Department for Minnesota
7. Requests for qualified instructors come most often to:
   A. State Department of Education, Certification Division.
   B. University of Minnesota, Placement Division, Department of Industrial Education.
   C. Vocational Division, State Department of Education.
   D. Vocational Certification Department for Minnesota.
8. Certification for teaching in vocational programs:
   A. entitles you to a job in teaching.
   B. makes it possible for you to accept a job if offered.
   C. puts you at the top of the list of qualified persons.
   D. gives you an edge on someone who has had the regular teache training.

9. Every teacher has a basic responsibility to the:
   A. knowing and doing of any trade or occupation.
   B. doing and being of any trade or occupation.
   C. knowing and being of any trade or occupation.
   D. knowing, doing, and being of any trade or occupation.

10. An analysis of a trade or occupation will tell you:
   A. almost all the things which might be taught about a trade or occupation.
   B. the specific elements which should be stressed.
   C. how to allocate your time in teaching.
   D. what you need in new equipment with which to teach.

11. Organizing course components for teaching involves the practice of:
   A. identifying and classifying instructional elements.
   B. determining objectives for units and elements of the course.
   C. selecting the most difficult components for initial attention in teaching.
   D. determining objects, teaching expedients and evaluation for units and lessons.

12. A well-done course of study provides:
   A. test items with which to conduct evaluation.
   B. those elements which need no evaluation.
   C. an insight into the need for evaluation.
   D. a base on which to build your program of evaluation.

13. A well-prepared teaching lesson covers:
   A. the essential steps which a teacher plans to follow in teaching the lesson.
   B. a step by step procedure for conducting evaluation.
   C. a step by step system of using auxilliary teaching expedients.
   D. the ways in which a student must conform to prescribed plans set down by the teacher.

14. Objectives are important in the daily lesson because:
   A. they ought to appear somewhere.
   B. they tell you where you're going and when you arrive.
   C. they make an ordinary lesson into a well-prepared, sophisticated plan.
   D. they provide an excuse for the teacher when he fails to give sufficient attention to the plan.

15. The materials for any lesson plan comes directly from:
   A. the textbook.
   B. the analysis procedure.
   C. the course of study.
   D. the requirement evaluation.

16. Learning among students in your classes involves:
   A. activity or involvement on your part.
   B. a stern order by the teacher.
   C. outside assignments requiring reading.
   D. having students of high ability.

17. Motor skill development in the trades or occupations:
   A. may be left to chance.
   B. generally develops quite naturally.
   C. may be redirected by giving written instructions.
   D. must be supervised directly by the teacher.

18. The use of instructional aids requires:
   A. little more than a knowledge of what is available.
   B. planning - as carefully as the teaching plan.
   C. a knowledge of which would best capture and hold the attention of students.
   D. a conviction that they should be used by every teacher.

UNIT	UNIT EXAMINATION
1	TEACHING IN THE VOCATIONAL-TECHNICAL SCHOOL

19. Teacher-made instructional aids are:
    A. seldom successful in use.
    B. unnecessary because commercial aids can be bought.
    C. essential at times because the very special ones are not usually available.
    D. a pain in the neck - let's admit it.
20. Classroom evaluation has at least two major purposes:
    A. it tells the instructor what the students have learned.
    B. it tells the students what the instructor is able to teach.
    C. it tells the teacher what students have learned and how well he has taught.
    D. it allows the supervisor to appraise the whole teaching-learning situation.

Appendix B

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER SHEET-UNIT EXAMINATION
I	TEACHING IN VOCATIONAL-TECHNICAL SCHOOLS

Name ____________________ Code No. ____________________
Date ____________________ Score ____________________
Discussion Leader ____________________

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

Before you begin the examination or while you are waiting for others to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

Appendix C

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER KEY - UNIT EXAMINATION
1	TEACHING IN VOCATIONAL-TECHNICAL SCHOOLS

Name ________________________
Date ________________________
Discussion Leader ________________________

ANSWERS	INSTRUCTOR NOTES

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	●	○	○
2.	○	○	○	●
3.	○	●	○	○
4.	○	○	●	○
5.	○	○	○	●
6.	●	○	○	○
7.	○	○	●	○
8.	○	●	○	○
9.	○	○	○	●
10.	●	○	○	○
11.	○	○	○	●
12.	●	○	○	○
13.	●	○	○	○
14.	○	●	○	○
15.	○	○	●	○
16.	●	○	○	○
17.	○	○	○	●
18.	○	●	○	○
19.	○	○	●	○
20.	○	○	●	○

Appendix D

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

FILM SCRIPT UNIT 1	DR. HOWARD F. NELSON TEACHING IN VOCATIONAL-TECHNICAL SCHOOL

AUDIO	VIDEO
Good evening.	
I am happy to have this opportunity to conduct this first session of the television series. I am Howard F. Nelson, Chairman of the Department of Industrial Education at the University of Minnesota. If you are wondering why I am involved in this I can tell you that my department, under law, was given this assignment many, many years ago. The Department of Industrial Education, Duluth, shares in this responsibility of providing educational services for vocational instructors and so the instructors of these two departments have been involved in this work for many years.	
As I initiate this series tonight I can tell you very frankly that we are interested to find out if we can do this work just as effectively over television as we can by conducting sessions with you in your communities. And naturally, if we are able to do this effectively over television this will enable us to multiply ourselves in our efforts many times and thereby reach more folks like yourselves. Eventually, if all goes well, I hope that we will be able to put some of this material on a sound movie film so that it may be used in your own schools at different times in the day.	
Now here is my plan for conducting this first session. I'm going to give you an overview of the entire series and try to give you a notion of how it all fits together. I'm going to do this by introducing separate units and as I introduce the separate units I'm going to introduce also the instructor who will conduct those units. At the same time I hope to illustrate how the separate lessons interrelate and how they depend upon each other. And for this introductory session I have asked myself several major questions to lead the discussions. And the first is what is the course. Well, the course is designed specifically for folks like yourselves,	

AUDIO	VIDEO
who are the official participants in this series, to provide you with the essentials of teaching which are necessary for certification in vocational-technical school teaching. When completed successfully, this course will count as the first 24 clock hours which are necessary for initial certification to teach in the courses and the programs in this state. Eventually you are going to need 190 clock hours of teacher training but I suggest that we not worry about that eventuality tonight. The course is organized into 12 half hour sessions which will be run off over channel 2 and 12 consecutive nights, probably at the same time as the present one. Six instructors will handle these lessons and each television session is going to be followed by a 1½ hour seminar with the instructor of that particular unit present at the seminar. As a matter of fact, you may think I am here, but I'm not. I tell you this as fair warning. There may be a group of you gathered together out in St. Cloud or perhaps down in Mankato and you feel impelled to make some unkind comments about the presenter of this particular unit. And so I give you this warning, because I may be sitting in the back of the room listening with you. You see I'm on your side. I want to find out if this fellow from the University is really putting money in the bank here this evening. I want to see if he is serving up pancakes hot off the griddle or whether he's dipping into that stack left over from a couple of weeks ago. The second major question which I would like to bring to your attention is this: for whom is the course intended? Well, it was developed especially for skilled craftsmen like yourselves, for people who want to become instructors in the vocational programs and courses in this state. The course is for men and women, like	

AUDIO	VIDEO

yourselves, who enjoy working with others, who take pleasure in seeing them grow and develop. The course is put together for those who are willing to take students where they find them, lead them to want to learn what they ought to learn, lead them to a level of skill and competence which they are going to need to compete successfully with their peers.

Now I am sure that you would want to know what you must do to meet the requirements of this course. Well, you are expected to observe carefully all of the television lessons. You are also expected to attend all 12 of the seminars held in your community near to you. We hope you will take part in these discussions and we'll ask you to take a short test of understanding of the content that has been presented in each of the units.

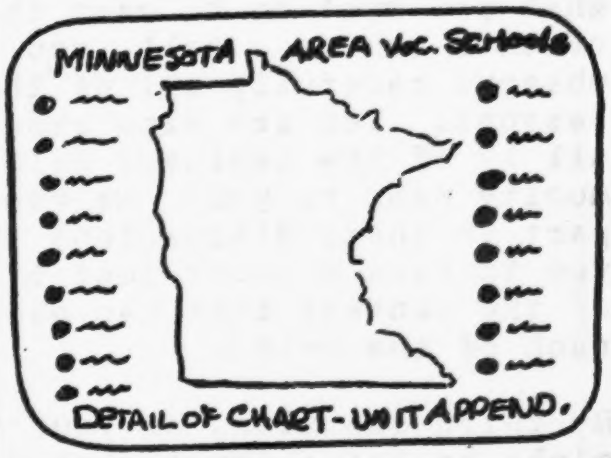
My third question, or your third question, might be this: "Well what do I get from this course?" As individuals you bring your trade, industrial, technical, occupational experience to these sessions. This you have gained over the years that you have worked. In other words, each of you bring to these sessions what you know and can do and put this into a systematic fashion for teaching purposes. Now if you are a skilled machinest, we are not going to alter that basic skill. But, we are trying to help you get ready to teach others what you know and can do about the machinest's trade. Now what happens next? Well, assuming that completion of all of the requirements which I have outlined earlier, your name will be certified to the Vocational Division, State Department of Education, Centennial Building, St. Paul, where you become a resource of trained personnel on whom the directors and others of the area schools may call. When a call comes in for someone who is possessed of your special competence your name will be there ready to go.

Now also upon completion of this television series, or even before, I would strongly recommend that you get acquainted

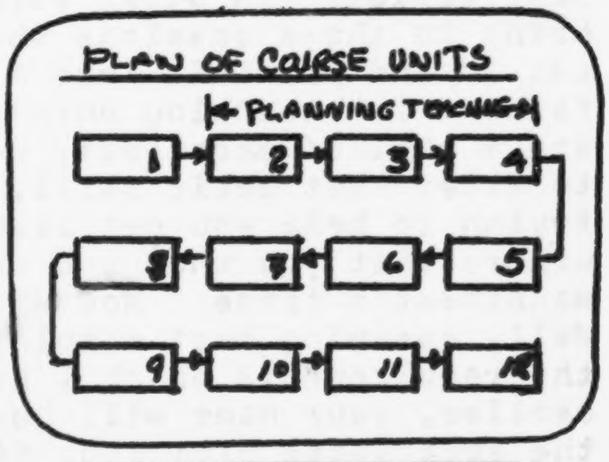
AUDIO | **VIDEO**

with the folks over in the vocational division. They are fine people to know. You should know them; they should know you. They should know that you are interested in teaching. I strongly urge that you also become thoroughly acquainted with the vocational program in your own community. I think you could spend some time there getting to know that total program. And I know many of these folks in the area schools, and you'll be welcome to visit with them.

Now since I've talked about the area vocational school in Minnesota I think you might like to have a notion about where these schools are located, and so I've prepared a map. In Minnesota we officially have twenty-six schools. Nineteen of these are open for business and the others are going to open just as soon as it's possible. All of them need teachers. If you glance at the map with me you will see that there is a geographical distribution of these schools where they are needed most. Actually they are quite strategically located so that no student or instructor has to drive very far to get to them.



I would like to make some observations about the vocational-technical program in Minnesota as one who travels quite a bit and visits in other states and other programs. I can tell you that I always come home to Minnesota very proud of the area vocational schools as we have them in this state. You'll have to travel a long way before you find a comparable program in another state.



Now as I indicated to you earlier I would like to take a look with you at each of the major units which have been incorporated in this series. I'll start off by taking Unit number 2, Analyzing for Instruction. Dr. William A. Kavanaugh will be your instructor for this unit and also Unit number 3. Actually these two might well be combined into one major unit which we would call Planning for Teaching. You will want to do a great deal of planning for teaching before entering any classroom

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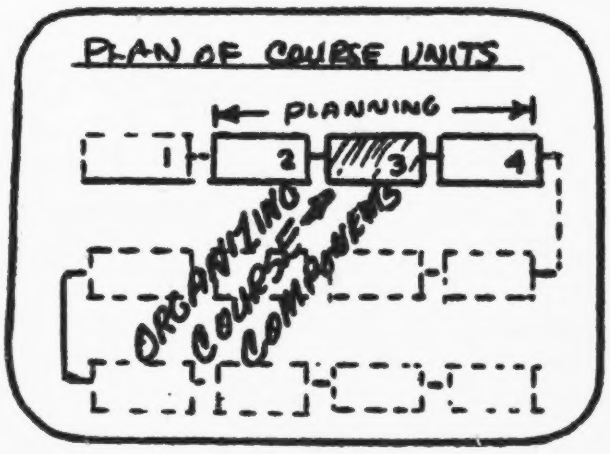
or laboratory. You have some very important decisions to make. Precisely, what are you going to teach. Let's assume for a moment that you are a skilled welder and I ask you what you're going to teach, and you tell me, "I'm going to teach welding". In the reality I don't think you are going to teach welding, but rather, you're going to teach your students what they must know, what they must be able to do, and how they must conduct themselves to be a successful welder. You see, I've identified three of the major responsibilities in teaching - namely, the knowing, the doing, and the being. These are across-the-board responsibilities for all teachers.

Now where do we get these essentials? Well, Bill Kavanaugh, in this unit will help you and show you how to analyze any trade or occupation and break it down into its basic components from which you will automatically gain components. You will establish the base for evaluation. And we have two units which will come up later which will deal with evaluation.

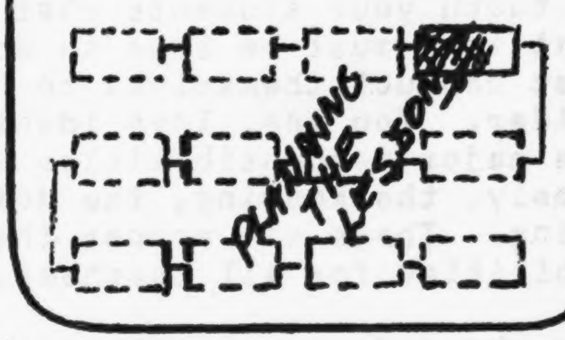


Unit number3, Organizing Course Components, will also be handled by Dr. Kavanaugh. Now in the previous unit you were given help with analyzing your trade or your occupation for teaching purposes. You've identified the knowing, the doing, and the being elements. At the same time you made an inventory of the components as you broke the trade or occupation down into very small parts. Now how in the world do you put them all back together? Well the process is called course organization. Course organization involves systemizing the small components into a broad plan for teaching. Bill Kavanaugh will do this in his third unit. He will help you develop the correct sequence of putting down these units. He will give you the logical order and he will give you principles for selecting the elements that you are going to teach. Does this sound complicated? and difficult? Yes, but it is one of the very most important things that you'll be doing. When it's

AUDIO	VIDEO

well done you automatically establish the base for your evaluation responsibility. You immediately find what you must determine about the achievements of the students that you teach.

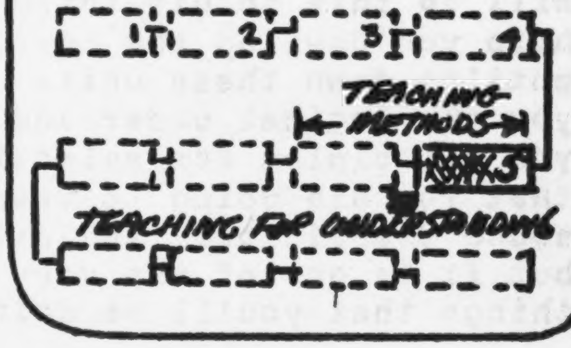
Unit number 4, Planning the Lesson. This particular unit will be conducted by Dr. Jerry Moss, Jr. The lesson is one of the most important activities in teaching. Every good teacher plans carefully for every appearance in the classroom or the laboratory. Every lesson is highly structured in order to guide instruction in the classroom. Each one tells you in a step-by-step fashion precisely what the teacher is going to do and it also provides reminders about what is important and auxiliary instructional aids that are needed on hand for use in the lesson.



In the 4th Unit, Jerry will outline the the elements of any well conceived lesson. He will tell you what you need and why you need it, and you will begin to systematize all of these essentials into a plan for teaching.

Now objectives which have been mentioned rather briefly in Unit number 2 and Unit number 3 come into very sharp focus in this particular unit. Every lesson has objectives, as a matter of fact, every course of study has objectives, and these are very important. They're important because they tell you when you have arrived. What you need to put together in this particular unit will be drawn almost entirely from the previous Units 2 and 3.

Unit number 5, Teaching for Understanding, will also be conducted by Dr. Moss who handled the previous one. Now you'll recall that I've used the expression several times "What you know and can do". Now I'd like to take that first element and zero in on it for a few moments if I may. When we speak of "knowing part of teaching" we are referring to that essential, related, supporting kind of information



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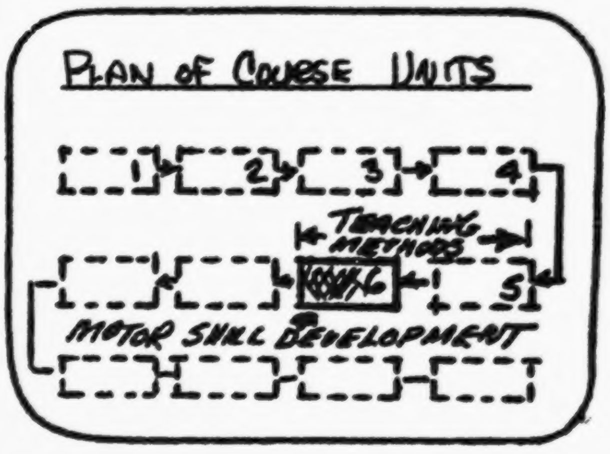
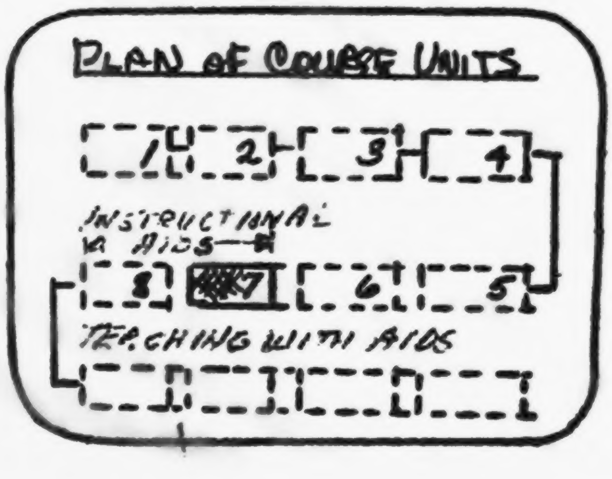
which every craftsman must possess if he is to be effective on the job. What are the best techniques to use to teach for understanding, teach the knowing elements of any trade or occupation? Do you tell students? Well sometimes, but rarely always. Do you send them off to get the information themselves? Well, sometimes. Rarely always. Is there an effective way of handling this particular assignment? Well we think so. Jerry Moss will attempt to give you three or four of the very best methods of teaching for understanding in this Unit number 5.

Now Unit number 6, Teaching for Motor Skill Development, will be handled by Mr. Dave Pucel, a graduate student in the Department of Industrial Education. Let me return once more if I may to the expression, "Know and can do". Well, let's take that last part "Can do" and focus in on the "do". Now when we talk about doing we'll find that this is involved in almost all of the crafts and it involves the motor skills which are inherent in them. How do you guide the correct development of motor skills? Well, we think there is some time-tested techniques and methods which you ought to know about so that you can incorporate them into your own teaching. Unit number 6 was designed to cover this very important responsibility of teaching, and Dave is going to give you some of the basic principles to help you decide which method or which technique should prove most effective for a given situation.



Unit number 7, Teaching with Instructional Aids, will be conducted by Dr. Neville Pearson, one of our fine colleagues from the Division of Curriculum and Instruction in the College of Education. He'll handle this unit and also Unit number 8 which follows. How can a vocational instructor make the most effective use of the rich resource of instructional aids which are available to him? These aids are teaching tools of tremendous value when properly utilized. Dr. Pearson is going to select three or four of the better ones and give



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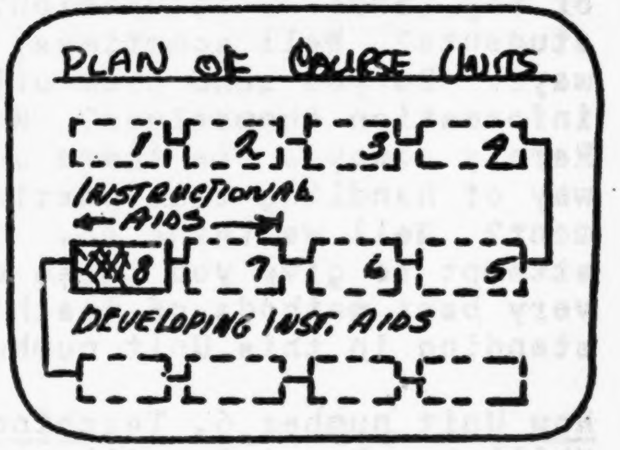
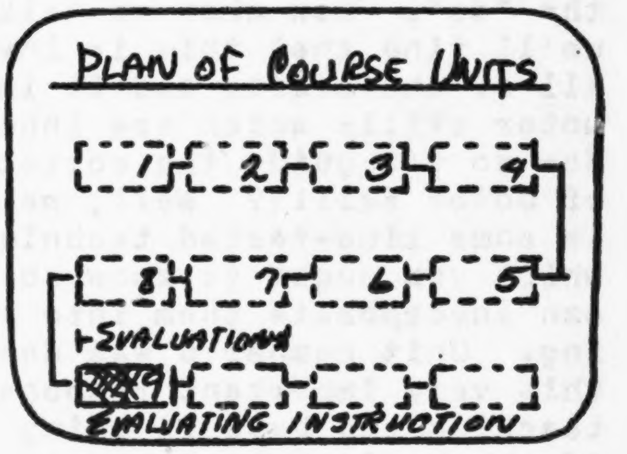
you the principles and the practices for their effective employment in the teaching situation.

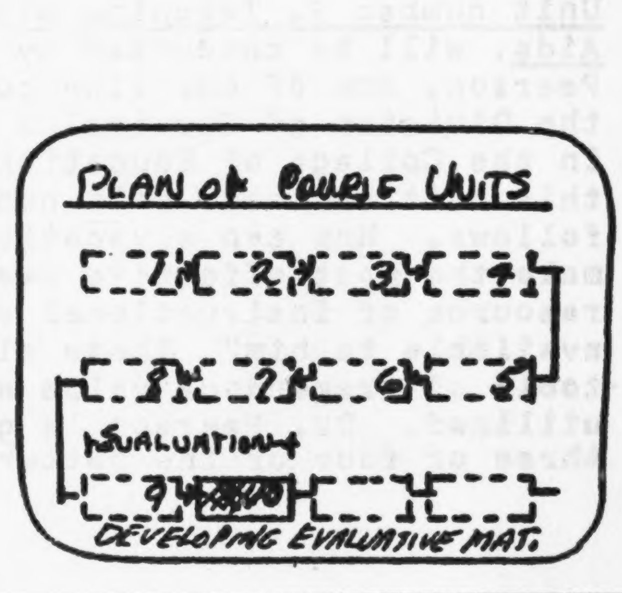


Unit number 8, Developing Instructional Materials, is a continuation of the Unit number 8 in which Neville will give you guidance and help to the problems of developing and preparing instructional aids when none are available. Now there are ocassions when a specific aid will put across a lesson or a concept which would be very difficult otherwise. Yet you must have one. And how do you go about this assignment? When this circumstance arises you have to make your own. You know, there is an old chinese saying that a picture is worth 10,000 words. Unit 8 will give you the help that you need to develop or make your own special instructional aids.



Unit number 9, Evaluating Instructional Outcomes, will be conducted by Dr. Robert Randleman. I should point out that this unit and Unit number 10 really belong together, but he is going to treat the two of them in separate presentations.

Evaluation of learning is an important aspect of teaching. First evaluation will tell you how much and how well your students have learned what you have wanted them to learn. And secondly, evaluation will tell you how well you have taught what you have intended for them to learn. Actually, there are many other important values associated with evaluation. I can't touch on very many of those in this introduction, but I know that Bob will deal with them one by one in the presentation of this 9th Unit.



Unit number 10, Developing Evaluative Materials, will also be handled by Bob. In the previous unit with him, you took a look at evaluation. That is, what is it? Why and how do we use it? The present Unit number 10 deals with the general problem of developing and making evaluative materials. Every teacher in the business, from

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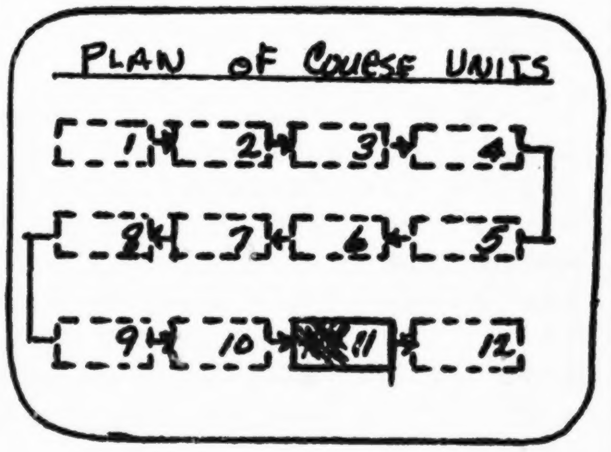
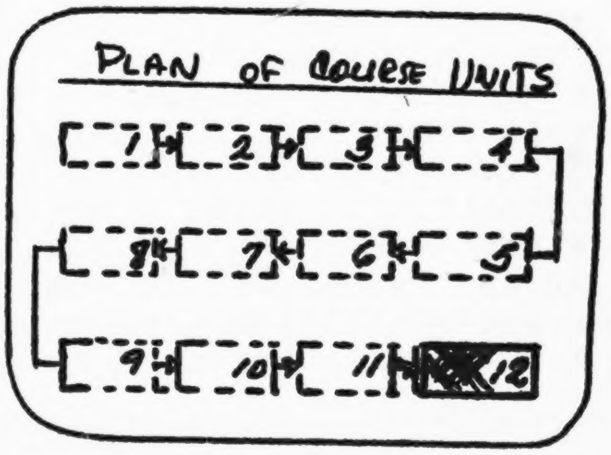
time to time, has to make what we call teacher-made tests. These are not easy to do well. But there are occasions when the teacher must develop a specific and appropriate instrument with which to appraise or assess growth and development of those being taught. This is the problem of evaluation, and we have included this particular unit to give you extra help and guidance as you prepare your own evaluative material. And Bob is well prepared to do this with you.



Unit number 11, Managing the Teaching-Learning Facilities, is also going to be handled by Dr. Randleman. Now we all know that there must be the physical circumstances which are conducive to teaching and learning in the classroom. And I am sure that all of you have experienced the opposite. I think there were ocassions where you have said "I just can't learn that here. It's too noisy; the radio is blaring; the lights are dim; the table is too low." Well we are pretty certain that the teacher has a basic responsibility of creating an environment for learning. This topic is the essence of Unit number 11.



Unit number 12, Planning your Teaching Career, will be the concluding unit of this series. And I am going to return at that time to cap off the series. By that time, I hope that I will have come to know each of you very, very well and to know something about your plans for making teaching your new career. By now, you may have suspected that this new career involves the same kind of hard work, study and practice which you put into the business of learning your first skill.

In the final unit, I will try to pull together the previous units and illustrate further the interrelationships among them.

And from the seminars, we may find some points which are unclear. I hope that I

AUDIO	VIDEO
may deal with them in this concluding unit. Now I would like to pull this together with a little thought which might be your motto as you enter upon teaching in the vocational-technical programs in Minnesota. In a trip this summer, I visited a little school over in Switzerland which is devoted to the preparation of vocational-technical teachers for their system over there. And over the door I saw a sign which I thought might be your motto for this particular series here. The sign said, "He who dares to teach must never cease to learn." He who dares to teach must never cease to learn - what is the implication in this? Well it simply says to me that if we are going to become involved in teaching, that we at the same time must assume the responsibility to continue to study, to read, discuss and learn all that we possibly can about the technique of teaching. This is not easy to do. This is a life long task, and so I think that this little motto will prove helpful as a guide to you as you move ahead in this new field. Now I would like to return if I may for just a few moments and make a review of all of the units as we have put them together. If you will direct your attention for the next few minutes to the chart, let's take a look at it. I've been dealing with that first unit in the upper lefthand corner which is called "Teaching in the Vocational-Technical School". In this, I have tried to paint a picture of the requirements in this television series and to tell you what your responsibilities are and what there is that you might get from this sequence. The next two units, which are "Analyzing for Instruction" and "Organizing Course Components" really combine into a major responsibility of planning for teaching. And then through the middle we have five blocks. On the left is "Developing the Daily Lesson", "Teaching for Understanding", "Teaching for Motor Skill Development", "Teaching with Instructional Aids", and "Developing Instructional Aids". Now those	

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teaching-learning expedients.

Then the two lower left hand units, "Evaluating Instructional Outcomes" and "Developing Evaluative Materials", combine into the major block of evaluation of instruction and learning.

The next to the last block deals with all of the techniques that are necessary in managing the classroom and the block is entitled, "Managing Teaching-Learning Facilities".

And then finally the block at the lower right is the one which I just reviewed with you and which I will return to conclude this television series with you.

Now just one final comment before we pull this first unit to a close. I think we should recognize that this first 24 clock hours of in-service teacher training constitutes but a very small sample of what you must have in the total pattern of teacher training for vocational-technical teaching. It would be very logical for us to come on back with a second series of 24 clock hours which would spiral in from the base of this first unit. It would give us an opportunity to deal with some of these same problems. But it would permit you to go much deeper in the separate units. And as we add another 24 clock hours to your training, at the same time we would provide still an additional opportunity to gain depth.

Well, I don't know about you, but I've enjoyed working with you on this television series. I hope it has been profitable to you. And may I remind you to tune in when lesson number 2 is projected.

Good night.

VIDEO

Appendix E

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	SUMMARY OF FILM PRESENTATION
2	ANALYZING FOR INSTRUCTION

This summary of Unit 2 is planned for student use before viewing the film presentation. It is suggested that this outline be given to students at the close of Unit 1 as shown in the "Method of Approach" for Unit 1. In addition to a preview, the outline can also serve as review notes for this unit. The information outlined in blocks below is a duplicate of the visual materials shown during the video presentation.

Unit 2 - Summary Review

I. Teacher Planning Course Components

A. Complete course

1. course outline
2. course syllabus
3. course teaching guide

B. Course units

1. objectives
2. teaching materials
3. method of approach
4. unit resource appendix

C. Unit lessons

II. Instructional Analysis Terminology

A. Analysis defined

> An instructional analysis is a technique whereby the essential elements of an occupation are identified and listed for instructional purposes.

B. Kinds of work analyses

> 1. employment
> 2. production
> 3. instruction or training

C. Kinds of work elements

> 1. knowledge or understanding
> 2. skills
> 3. work habits

UNIT	SUMMARY OF FILM (CONTINUED)
2	ANALYZING FOR INSTRUCTION

D. Instructional elements

1. doing
2. knowing
3. being

E. Definition of Learning

Learning is a change in behavior through experience.

F. Psychological names for behavior elements

1. cognitive
2. motor-sensory
3. affective

G. Industrial terminology for instructional elements and work elements

Doing	Operations and Jobs
Knowing	Related Information Topics
Being	Work Habits

H. Operation defined

An operation is a unit of work in a job that involves action in the form of depicting, shaping, forming, testing.

I. Job defined

A job is a piece of work involving two or more operations in combination.

III. Doing Elements

A. Sizes

Smaller	Basic	Larger
OPERATING STEP	OPERATION	JOB

UNIT	SUMMARY OF FILM (CONTINUED)
2	ANALYZING FOR INSTRUCTION

B. Crit~~y~~eria For an Operation

1. Constant over long time periods
2. Complete piece of work
3. Involves steps of action
4. Distinct unit of work
5. Most useful when used in combination

C. Sample Operation Titles

How to:
1. Paint a surface
2. Knurl a piece
3. Make a recovery bed
4. Hone a razor

IV. Knowing Elements (Related Information)

A. Definition

Related information is information the worker must know to form judgements in his work.

B. Kinds of Related Information Topics

1. Technical Information - information the worker must know to form judgements in his work.

2. Guidance Information - information needed for progress on the job.

3. General Information - information classified as nice-to-know, desirable, but not essential.

C. Knowing Element Sizes

Smaller	Basic	Larger
Related Information Point	Related Information Topic	Related Subject

D. Samples of Information - Topic Titles

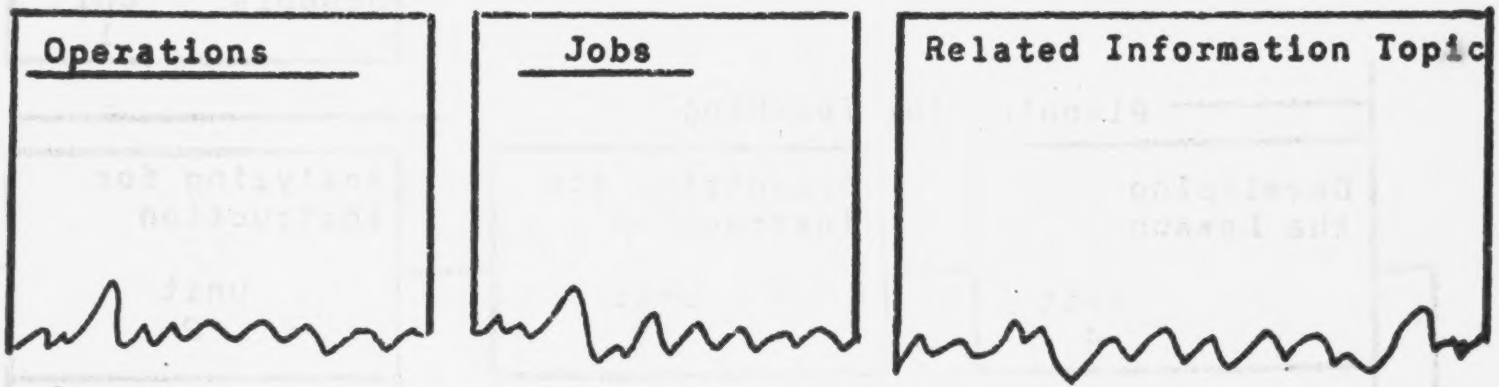
1. Kinds of tool steel
2. Furniture joinery
3. Calculation of circuit resistance
4. Characteristics of sterilizing solutions

UNIT	SUMMARY OF FILM (CONTINUED)
2	ANALYZING FOR INSTRUCTION

V. A. The Analysis Procedure

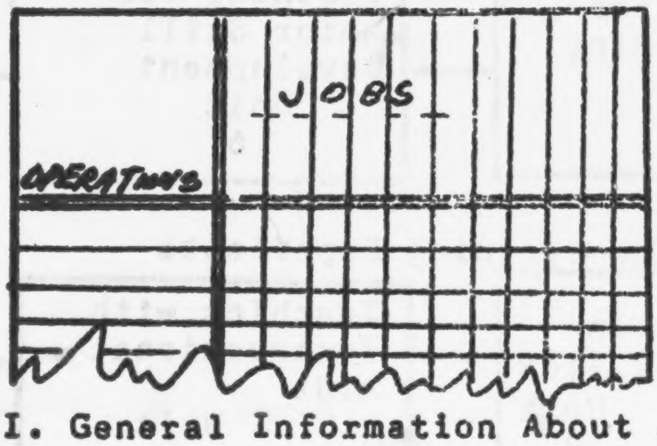
1. Block occupation
2. Make Master list of elements
3. Chart elements
4. Determine element order

VI. Master Lists

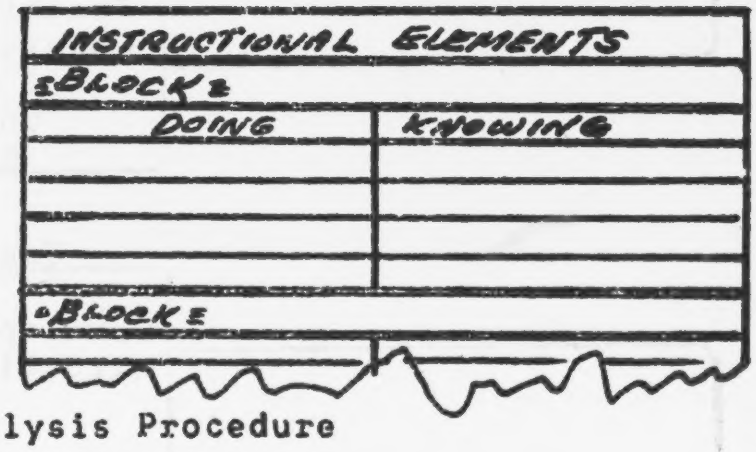

Operations
Jobs
Related Information Topic

VII. Charting

A. GRID CHART


JOBS
OPERATIONS

B. COLUMN CHART


INSTRUCTIONAL ELEMENTS
=BLOCK=
DOING
KNOWING
=BLOCK=

VIII. General Information About Analysis Procedure

A. How to Teach a Trade (Selvedge)

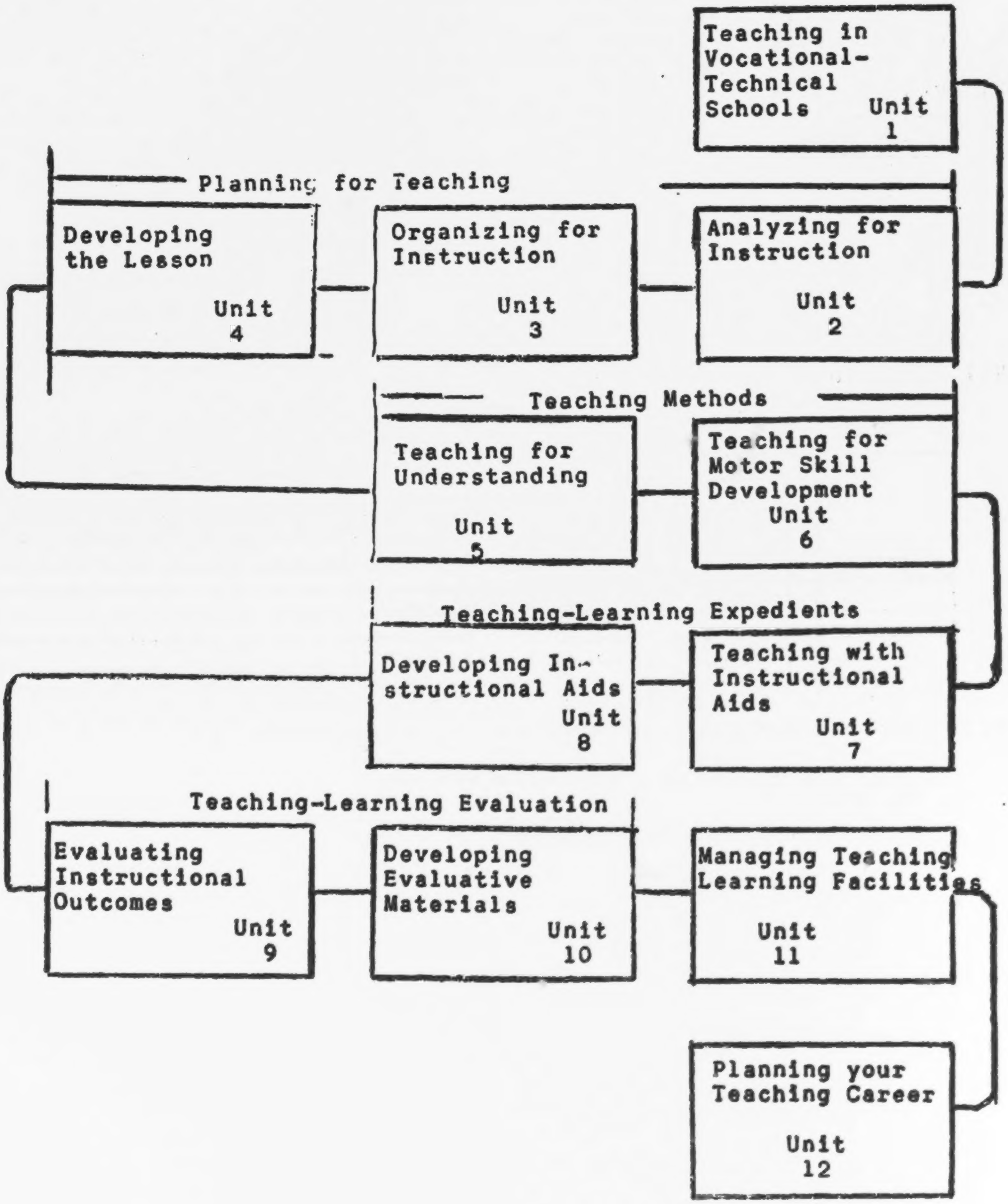
B. Trade and Job Analysis (Fryklund)

C. Analysis Technique for Instructors (Fryklund)

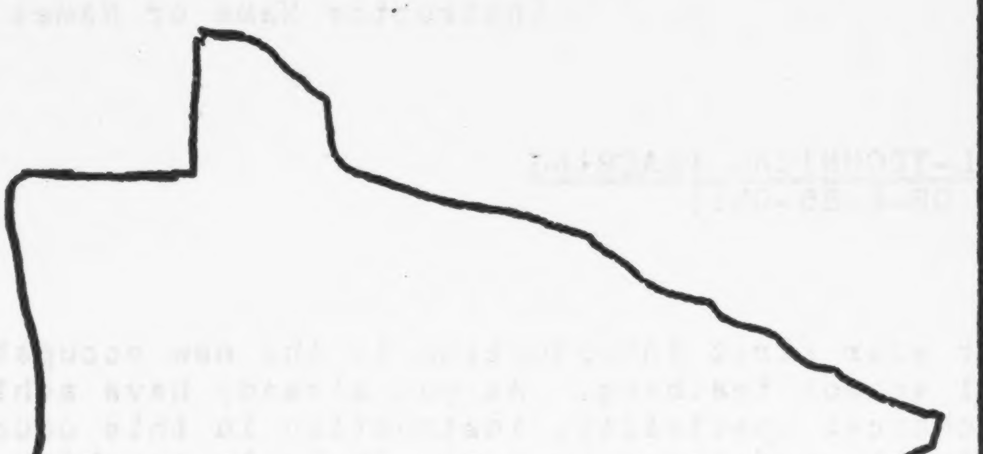
Appendix F

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT TEACHING IN THE VOCATIONAL-TECHNICAL SCHOOLS
CHART OF COURSE UNITS


Teaching in Vocational-Technical Schools Unit 1
Planning for Teaching
Developing the Lesson Unit 4
Organizing for Instruction Unit 3
Analyzing for Instruction Unit 2
Teaching Methods
Teaching for Understanding Unit 5
Teaching for Motor Skill Development Unit 6
Teaching-Learning Expedients
Developing Instructional Aids Unit 8
Teaching with Instructional Aids Unit 7
Teaching-Learning Evaluation
Evaluating Instructional Outcomes Unit 9
Developing Evaluative Materials Unit 10
Managing Teaching Learning Facilities Unit 11
Planning your Teaching Career Unit 12

Unit	Minnesota Area Vocational-Technical Schools
1	



1	Alexandria
2	Austin
3	Anoka
4	Brainerd
5	Detroit Lakes
6	Duluth
7	Eveleth
8	Fairbault
9	Grand Rapids
10	Granite Falls
11	Hibbing
12	Jackson
13	Mankato
14	Minneapolis
15	Moorhead
16	Saint Cloud
17	Saint Paul
18	Staples
19	Thief River Falls
20	Rochester
21	Pipestone
22	Wadena
23	Wilmar
24	Winona
25	
26	
27	

SAMPLE	STUDENT COURSE SYLLABUS
INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING	

A vital part of any course and its teaching-learning materials is the Student Course Syllabus. With such a guide, students can look ahead and see how and when each component of the course develops. Students generally ask for one if it is not presented and the instructor is immensly helped in the overall plan with it.

With this thought in mind, the following sample student syllabus with suitable headings to fit your vocational schools should be duplicated and given to beginners the first class session or before as the situation permits.

Syllabus Format (Sample)

Your School	Vocational Teacher Education
Location	Instructor Name or Names

Syllabus For --

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE-6-85-051)

Course Introduction

This course is planned for your first introduction to the new occupation of vocational or technical school teaching. As you already have achieved top competence in your technical speciality, instruction in this course is focused toward professional competence in a new field in teaching.

Just as you become expert in your industry, business, or health occupation by knowing and using technical information, and by practice for skill development and just as you gained recognition in your field through development of professional feelings and actions about quality, craftsmanship, work attitudes, and co-work relations, so in this course you will start toward these same competencies in a new field.

This course is planned around twelve class sessions called course units. Each unit requires two clock hours of instructional time with outside work as the instructor may require. Each unit will be a lesson and cover a vital part of teacher education needed for beginning teaching, planning for teaching, and teacher evaluation of learning.

Each unit of this course will be taught through one-half hour of video instruction by either 16mm sound film or television viewing and ninety minutes of group discussion and examination.

References

Video presentations for each unit
Duplicated film summary hand-out materials
Duplicated activity materials

SAMPLE | STUDENT COURSE SYLLABUS (CONTINUED)
INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING

Course Evaluation

The final evaluation of your work in this course will be determined by the following measures:

Eleven unit tests, 20 points each ------------------220 points
One final examination -----------------------------150 points
Possible total test score -------------------------370 points
The passing score for your class will be given
by the instructor and is ----------------------------? points
The final examination will be given an ______________________.

Course Units

The units for study in this course include the following titles and will be presented on the dates given to you by the instructor.

COURSE UNIT	UNIT TITLE	PRESENTATION DATE
1	Teaching in Vocational-Technical Schools Video - Dr. Howard F. Nelson	
2	Analyzing for Instruction Video - Dr. William A. Kavanaugh	
3	Organizing Course Components Video - Dr. William A. Kavanaugh	
4	Planning the Lesson Video - Dr. Jerome Moss, Jr.	
5	Teaching for Understanding Video - Dr. Jerome Moss, Jr.	
6	Teaching for Motor Skill Development Video - Dr. David J. Pucel	
7	Teaching with Instructional Aids Video - Dr. Neville P. Pearson	
8	Developing Instructional Aids Video - Dr. Neville P. Pearson	
9	Evaluating Instructional Outcomes Video - Dr. Robert R. Randleman	
10	Developing Evaluative Materials Video - Dr. Robert R. Randleman	
11	Managing Teaching-Learning Facilities Video - Dr. Robert R. Randleman	
12	Planning your Teaching Career Video - Dr. Howard F. Nelson	

Unit 2

Analyzing for Instruction

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT 2 OBJECTIVES

A student achieving the broad objectives for this course as clarified for this unit should:

(1) Understand and be able to use vocational terminology common to the instructional analysis technique.
(2) Understand the underlying principles and practices involved in making an instructional analysis.
(3) Develop first appreciations about the value of the analysis technique as an inventory and planning tool for teaching.

The specific objectives (content) for attainment in this unit are:

STUDENTS WILL UNDERSTAND: cognitive principles, theories, concepts

1. Analysis for Planning
   A. Content Selection
   B. Teaching Method
2. Definition for Learning
   A. Change
   B. Behavior
   C. Experience
3. Instructional Analysis
   A. Inventory
   B. Elements
   C. Classification
4. Purposes for an Analysis
   A. Possible Content
   B. An Order for Elements
   C. Industry Changes
5. Elements of an Analysis
   A. Knowing-Cognitive
   B. Doing-Motor Sensory
   C. Being-Work Habit
6. Vocational Terminology
   A. Jobs-Problems-Projects
   B. Operations-Procedures
   C. Work Habits-Attitudes
7. Making an Analysis
   A. Personal Experience
   B. Experience of Others
   C. Logical Structure
8. Operation or Procedure Criteria
   A. Frequency of Use
   B. Time and Location Uses
   C. Unity-Piece of Work
   D. Action Steps
   E. Definite Order of Steps
9. Information Classification
   A. Technical
   B. Guidance
   C. General
10. Analysis Charts and Forms
    A. Grid Chart
    B. Two-Column Chart
    C. Operation or Job Sheet
    D. Progress Chart
11. Classification for Skill
    A. Speed
    B. Accuracy
    C. Confidence
12. Grid Chart for Skill Elements
    A. Frequency of Use
    B. Jobs-Simplicity-Complexity
    C. Block Base
13. Recording Information Points
    A. Parenthesis
    B. Notes
    C. CAUTIONS
14. Business and Industry Analyses
    A. Training
    B. Production
    C. Employment
15. Information Topics
    A. Organizers
    B. Branching and Sequencing
    C. Outlining Form
16. Historical Development
    A. Allen
    B. Selvidge
    C. Fryklund

UNIT 2	INTRODUCTION

Unit 2, "Analyzing for Instruction", is one of a series of twelve unit lessons designed for prospective vocational teachers for their first course of instruction. The content of this lesson will emphasize in overview the Instructional Analysis procedure and its place in the total job of planning for teaching.

Since the content of this lesson is basic to the planning phase of course, unit, and lesson development, this lesson must be taught second in this series. Any other teaching order for this lesson would upset the logic and continuity of the rest of the course units.

It should be emphasized for the seminar discussion leader and students that in a total of two hours devoted to this subject only an overview and the first basic principles can be accomplished. The subject has enough content and depth that it is usually taught as a whole course of twenty-four clock hours.

The seminar-discussion session for this unit should provide an opportunity for students to apply as many as possible of the basic ideas to their field of interest. The appendix hand-out materials included with this unit are designed to help the discussion leader initiate the first application of principles discussed in the television presentation.

TEACHER'S GUIDE

FOR

ANALYZING FOR INSTRUCTION

UNIT 2

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining filmed presentations and seminar discussions designed to provide twenty-four clock hours of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 2	LESSON MATERIALS

The following teaching materials to help you with the teaching of this unit are included in this resource appendix. You will want to duplicate the number of necessary copies to use as you lead the seminar-discussion.

Materials

A. The thrity-minute film, "Analyzing for Instruction", may be obtained from the Director, Vocational Section, State Department of Education, Centennial Building, St. Paul 55101.

B. Script of Film, Analyzing for Instruction

C. "Summary of Film Presentation"

D. Unit 2 Test

E. Unit 2 Test Answer Sheet (keyed)

F. Practice Sheet for Element Titles

G. Practice Sheet Grid Type Analysis Chart

H. Unit References

UNIT 2 | SUGGESTED METHOD OF APPROACH*

DISCUSSION LEADER	STUDENT ACTIVITY
1. Introduce unit with "Summary of Film Presentation" hand-out sheet. (Sample for duplication in the unit appendix) Advise students that this summary eliminates the need to take notes during the film viewing and that it can also be used later as review material.	1. Study the summary sheet for the kinds of items summarized.
2. Arrange for film viewing either individually or for a group.	2. View film for Unit 2, "Analyzing for Instruction".
3. Give Unit 2 test. (Copies and answer sheets duplicated previously from sample in the unit appendix). Advise students to mark only the answer sheets so that test forms can be used again.	3. Complete test answer sheet (no time limit).
4. Provide test answers.	4. Correct answer sheet. Mark test score on progress chart by code number. Instructor will provide code numbers.
5. Initiate discussion from student test responses.	5. Return answer sheets to instructor.

*The same approach can be used for one student or a group of students. While this approach is a suggested one, it is suggested also that the teacher for whom this content is new follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 2 | SUGGESTED METHOD OF APPROACH

Continued ----

DISCUSSION LEADER	STUDENT ACTIVITY
6. Demonstrate: How to Write an Operation Title How to Write a Job Title	6. Write a few practice titles on the worksheet provided. Write these against criteria listed on the same sheet.
7. Review quickly the Grid type Analysis Chart. Assign for a few minutes a few practice entries on the blank chart provided.	7. Start a Grid type Analysis Chart for a field of their interest. Make a few entries for practice to show that the chart works.
8. Get from the class samples of information topic titles. Demonstrate correct form for a topic title.	8. Write a few sample titles of information topics for critique and discussion.
9. Initiate discussion about use of analysis charts and the students field of work. ***	
10. Introduce next course unit and hand out copies of, "Summary of Film Presentation", for Unit 3.	

***This summary sheet may be given at the end of a unit for study between class sessions or at the beginning of the seminar discussion.

UNIT 2	UNIT RESOURCE APPENDIX ANALYZING FOR INSTRUCTION

RESOURCE MATERIAL

A. Unit Test

B. Unit Test Answer Sheet

C. Unit Test Answer Key

D. Film Script

E. Hand-Out Film Summary

F. Hand-Out - Practice Sheet - Element Titles

G. Hand-Out - Practice Sheet - Analysis Chart

I. Teacher References

UNIT	UNIT EXAMINATION
2	ANALYZING FOR INSTRUCTION

Directions: This examination is designed to evaluate your learning for the formal video or film presentation part of this unit of study. Answer each item by darkening the appropriate letter as shown by the example on the answer sheet. All answers are recorded only on the answer sheet. Do not make any marks on this test form.

1. An instructional analysis used for developing a course of study is best described by the word:

   A. summary
   B. inventory
   C. outline
   D. syllabus

2. One of the following is not an instructional element as the term was used in this unit.

   A. Instruction Sheet
   B. Basic Procedure
   C. Information Topic
   D. Attitudinal Behavior Statement

3. The most vital word in our definition of learning as it related to the elements of an analysis was:

   A. knowing
   B. experience
   C. doing
   D. behavior

4. One of the following is not a valid justification for making an instructioaal analysis.

   A. clarify course objectives
   B. determine instructional order
   C. inventory possible content
   D. determine learning difficulty

5. The term "job" as used in an instructional analysis means:

   A. a piece of work
   B. a work title
   C. a payroll title
   D. a large operation

6. One of the following is not a good source of information for an analysis for planning for teaching.

   A. personal experience
   B. viewed experience of others
   C. analyses made by others
   D. industrial job descriptions

7. One of the following is not a criteria point for judging an operation.

   A. learning difficulty
   B. frequency of use
   C. definite steps of action
   D. unity or wholeness

8. Information related to jobs and operations is most often classified as:

   A. operation-procedure-process
   B. cognitive-skill-affective
   C. partly-directly-unrelated
   D. technical-guidance-general

9. From an analysis charting procedure, factors important for instructional order are:

   A. speed-accuracy-confidence
   B. frequency of use-complexity
   C. learning ease-difficulty
   D. knowing-doing-being

10. The two factors to consider in making a grid type analysis chart are:

    A. operations and jobs
    B. skills and information
    C. work habits and information
    D. job ease and difficulty

UNIT	UNIT EXAMINATION
2	ANALYZING INSTRUCTION CONT'D

11. In analyzing work habits, one of the following would not be considered a Being behavior instructional element.

A. Always wear glasses when operating grinder
B. Appreciate time factor in producing a quarter millionth dimension
C. Understand vital work conditions for precise measurement
D. Always open circuit before making current measurement

12. The block base obtained during the analysis chart development is important for:

A. Teaching methods
B. Placing groups of operations in most desirable sequence
C. Specifying aims for a course or unit
D. Determining best order for jobs or projects

13. How To Teach A Trade was an original analysis procedure developed by ______________ during WWI.

A. Fryklund
B. Johnson
C. Selvidge
D. Nelson

14. The most important factor in outlining information topics is:

A. Organizing pattern
B. Outlining coding system used
C. Kind of information topic (general-technique-guidance)
D. Sequence in which topic will be given

15. In actual work Doing, Knowing and Being behaviors are called:

A. Course components
B. Work Specifications
C. Profression factors
D. Instructional elements

16. One of the following is not included in the definition of an operation.

A. small unit of work
B. part of a job
C. involves action steps
D. contains information topics

17. A grid type analysis chart cannot be used for:

A. operation;frequency use
B. job complexity information
C. Work habit importance
D. operation black base

18. Breaking an operation into its operating steps is important for:

A. Information topic planning
B. Demonstrations of an operation
C. Choosing a teaching method
D. Clarifying technical information

19. One of the following planning steps is most dependent upon an instructional analysis

A. know what to teach
B. choose best teaching method
C. construct best test items
D. plan for laboratory organization

20. A basic Doing element is the:

A. operation
B. Information topic
C. job
D. information point

Appendix B

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER SHEET - UNIT EXAMINATION
2	ANALYZING FOR INSTRUCTION

Name
Code No.
Date
Score
Discussion Leader

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

Before you begin the examination or while you are waiting for others to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

Appendix D Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

FILM SCRIPT	DR. WILLIAM A. KAVANAUGH
UNIT 2	ANALYZING FOR INSTRUCTION

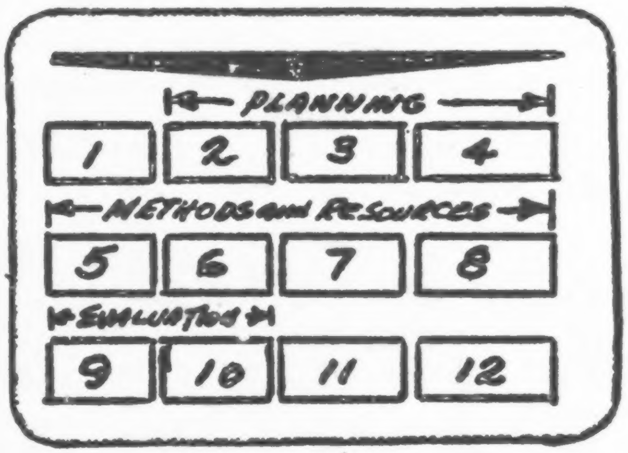
AUDIO	VIDEO

Good Evening.

Welcome to the second unit of your course, Introduction to Vocational-Technical Teaching. Tonight's lesson is entitled, Analyzing for Instruction. I am William Kavanaugh, your instructor for this lesson and also for the session next time.

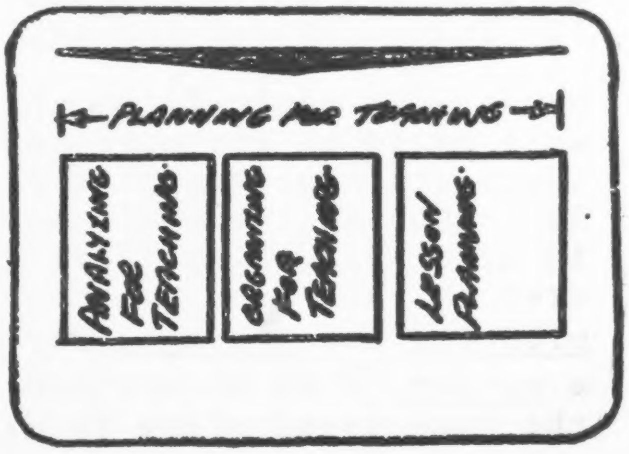
During tonight's discussion we will be looking into fields of work and occupations for skills, understandings and work habits, essential for competence in work. We will be using inventory, inspection, and charting techniques for ordering and sequencing of elements. The process I will explain and demonstrate is called the Instructional Analysis technique.

Before beginning our study of instructional analysis, it would be helpful to review some of the points of last week's lesson, particularly those ideas about the place and purpose of analysis in the teacher planning process.



You will recall from Dr. Nelson's presentation last week that all teachers in Minnesota vocational and technical schools are certified for teaching their speciality. The professional courses required for teacher certification were shown to you in chart form and were in three general areas as:

1. Planning for Teaching
2. Teaching Methods
3. Evaluation of Learning and Teaching



From the chart presented and shown here in review, you will also recall that three units of this course will give emphasis to teacher planning. These areas are:

FILM SCRIPT	ANALYZING FOR INSTRUCTION
UNIT 2	PAGE 2

AUDIO	VIDEO

1. Analyzing for Instruction
2. Organizing a Course of Instruction
3. Planning a Lesson

Tonight's study is centered in the first of these teacher planning areas; analyzing for instruction. You will recall also from last week's discussion that total planning for teaching vocational courses involves developing course outlines and smaller parts within the course called course units and even smaller subdivisions of the units called unit lesson. However, you were cautioned that before any planning for the total course or its subdivisions could be accomplished, the total body of teaching content must be known specifically and precisely. The analysis procedure is the planning tool that can furnish the content in the form of instructional elements. This importance of the analysis technique places this subject as the second unit of your course.

2

ANALYSIS DEFINED
An Instructional Analysis is a technique whereby the essential elements of an occupation are identified and listed for instructional purposes.

1. A good place to start our discussion of analysis this evening is with a definition of Instructional Analysis. Basically it is an inventory, listing, and charting technique and for vocational teaching is defined as:

.......An Instructional Analysis is a technique whereby the essential elements of an occupation are identified and listed for instructional purposes.

The two words of great importance in this definition, are of course: (1) Element and (2) Instructional Purpose.

Because an analysis of an occupation or work could be for purposes other than instruction or training programs, it is important at the beginning that you keep in mind everything about analysis considered in this lesson is for later use in planning for teaching for competence for a worker in an occupation. Also because the same terminology is used in other work analyses, the purpose is not the same. For example, an occupation could be analyzed for:

AUDIO

1. Employment
2. Production
3. Instruction or Training

Again, because in this lesson we are only concerned about analyzing an occupation for teaching purpose, the elements we are seeking are called Instructional Elements. There are three kinds of instructional elements in any work or occupation and these include:

1. Some understandings (knowledge) to be acquired
2. Some skills to be mastered
3. Some work habits to be developed

3. In vocational and technical teaching terminology, the instructional elements have vocational terminology and are called:

1. Doing Elements
2. Knowing Elements
3. Being Elements

The three kinds of vocationally named instructional elements get their names from an understanding and definition of learning.

Learning as defined for our purpose is a change in behavior through experience and the kinds of behavior changes taking place when a student has learned can be considered as:

1. A knowing kind of behavior change, or after learning the student knows something he didn't know before.
2. A doing kind of behavior change, or after learning the student can do something he couldn't do before.
3. A being kind of behavior, or after learning the student acts differently than before because he possesses different attitudes, appreciations, and values.

VIDEO

4.

Kinds of Work Analysis

1. Employment
2. Production
3. Instruction or Training

5.

Kinds of Work Elements

1. Knowledge of Understanding
2. Skills
3. Work Habits

6.

Instructional Elements

1. Doing
2. Knowing
3. Being

7.

LEARNING is a change in behavior through experience.

Appendix C Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER KEY - UNIT EXAMINATION
2	ANALYZING FOR INSTRUCTION

Name ______________________________
Date ______________________________
Discussion Leader ______________________________

ANSWERS	INSTRUCTOR NOTES
EXAMINATION ANSWERS (Darken the appropriate circle)	

	A	B	C	D
1.	○	●	○	○
2.	●	○	○	○
3.	○	○	○	●
4.	○	○	○	●
5.	●	○	○	○
6.	○	○	○	●
7.	●	○	○	○
8.	○	○	○	●
9.	●	○	○	○
10.	●	○	○	○
11.	○	○	●	○
12.	○	●	○	○
13.	○	○	●	○
14.	●	○	○	○
15.	○	○	○	●
16.	○	○	○	●
17.	○	○	●	○
18.	○	●	○	○
19.	●	○	○	○
20.	●	○	○	○

AUDIO

From these behaviors, expected when learning takes place we get the vocational terms: doing, knowing, being.

The same behavior changes of the doing, knowing, and being kind have psychological names also and when referred to in educational psychology are called:

1. Cognitive - for knowledge
2. Motor-Sensory - for manual and psychomotor skills
3. Affective - for work habit, attitude, and appreciation

These psychological names will not be used in this lesson and only very little in this course. A knowledge of their existence at this time is important for later vocational teacher education courses you will be taking.

The same three kinds of instructional elements have business and industrial titled when applied to the actual work or occupations. These are:

1. Basic Operation - for doing elements
2. Related Information Topics - for knowing elements
3. Work Habit - for being elements

These industrial and business names: operation, related information topic, and work habit are of first importance for this lesson because they are the actual things we look for and list when analyzing for teacher planning.

In vocational and technical school today teaching the basic "doing" element is the basic operation and is defined as:

An operation is a unit of work in a job that involves action steps - depicting, shaping forming, testing, and others.

VIDEO

8.

PSYCHOLOGICAL NAMES
FOR BEHAVIOR ELEMENTS

1. Cognitive
2. Motor-Sensory
3. Affective

9.

INDUSTRY TERMINOLOGY

Doing	Operation & Job
Knowing	Related Information Topic
Being	Work Habit

10.

OPERATION DEFINED

An operation is a unit of work in a job that involves action-depiction shaping, forming, testing, others.

AUDIO

The job is defined as:

The job is a piece of work in a job that involves action steps - depicting, shaping, forming, testing, and others.

Some basic operations in common occupations are shown in the following slides. Note in all of these illustrations that the worker is performing a very small piece of work which is important and complete in itself but when used along would not be sufficient for competence in a field of work. The competent technician or craftsman must be able to perform skillfully many operations and also must be able to perform judgements in putting these together in combination jobs.

Note: Slide 1 - Cabinetmaking Operation
2 - Machine Shop Operation
3 - Basic Operation in Cosmetology
4 - Basic Operation for the Medical Technician

Note: In some service and health occupations, the basic doing element, the operation, is sometimes called a basic procedure. For analyzing for teaching and for planning and teaching either term could be used.

Industrial doing elements larger than the basic operation are called jobs and doing elements smaller than the operation are called operating steps. This additional terminology will take on more importance when planning for the demonstration of an operation and will be given considerable emphasis in unit 5 of this course, Teaching for Skill Development.

VIDEO

JOB DEFINED

A job is a piece of work involving two or more operations in combination.

Slide Cabinet Making	Slide Machine Shop
Slide Cosmetology	Slide Medical Technician

DOING ELEMENT SIZES

Operating Step:
Part of operation

Operation: Basic

Job: Operations in Combination

AUDIO	VIDEO
8. The actual work titles for operations and jobs are always written in the same form. They are so written that they can be preceded by the understood works, "How to". This, of course, means the title must always start with a verb. For example: (How to) Paint a Surface Clean a Spark Plug Knurl a Piece Take a Blood Pressure Make a Recovery Bed Sometimes the "ing" (participle form) is seen in the work of beginning analysts. This is not good practice as it results in confusion with Knowing element titles as you will see later.	OPERATION OR JOB TITLES (How to) Paint a Surface Knurl a Piece Make Recovery Bed Hone a Razor Service a Generator
9. Operations are basic doing elements and are of first importance in planning for vocational teaching and in the actual teaching itself. However, as you begin lists of jobs and operations you may have difficulty in determining whether a piece of work is of operation or job size. If you have trouble in making this distinction, list the element as an operation and continue with your listing. If you were wrong with a particular element this will show up later and it can be changed. The following criteria for an operation will help you to make the distinction. 1. Operations remain relatively constant over a long time period and in different geographical locations. 2. Operations are small complete pieces of work but have little use by themselves. They are used in combination to perform larger units, jobs. 3. Operations are of such a size they can be demonstrated during a class period. 5. An operation is a distinct unit of work and can be learned without reference to a particular job.	CRITERIA FOR AN OPERATION 1. Constant 2. Complete 3. Action steps 4. Class demonstration 5. Distinct Unit of work

AUDIO	VIDEO

Jobs in contrast to the operation are quite variable from time to time and place to place. Different companies may emphasize quite different jobs in their employment while the basic operations used in the different jobs are quite constant.

10. The basic Knowing Instructional Element is the Related Information Topic. In vocational and technical school teaching knowledge takes this name so that it will be relevant to practice of the operations and jobs. Related information is knowledge the workman should know to make judgements and progress on the job. A fine classification of kinds of information topics is generally not needed for an instructional analysis. Three kinds of information topics, however, do have importance in planning for the best use of course tools.

The three kinds of information topics are:

1. Technical Information
2. Guidance Information
3. General Information

Technical Information is the kind of information the workman must know in order to form judgements in doing his work. Without this information in most occupations, the worker could not be classified as more than a helper. Technical information could be directly related or indirectly related. Whether the technical information be in science, mathematics, communications, or whatever, if it is needed to make judgements, it is technical information. When course and training time is limited this is the must know kind of information and must be included in the course planning.

Guidance Information is the kind of information the worker needs for progress on the job. Information on how to secure a job, schooling to advance on the job employer-employee relations, and a host of other topics in the area of vocational guidance

19.

Related Information
Is information the workman should know to make judgements and progress on the job.

20.

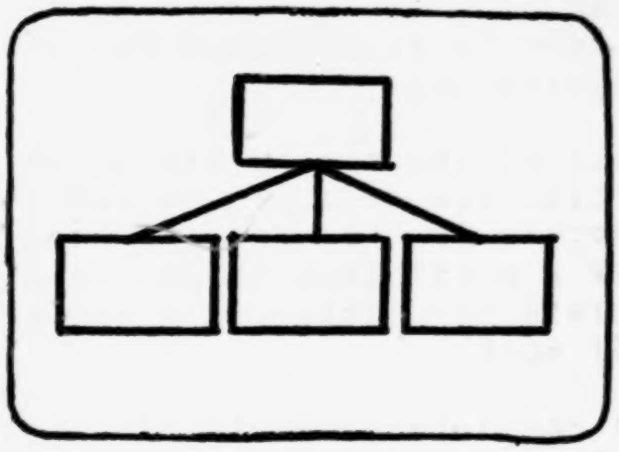
Technical Information
Is information the workman must know to form judgements in his work.

21.

Guidance Information
Is information needed for progress on the job.

AUDIO	VIDEO
are all a part of guidance kind of information topics. In all but emergency training programs this kind of information has great importance and part of the analysis for inclusion in the later plans for teaching. General Information topics are classed as nice-to-know. They are desirable and good for the worker in the occupation but not necessary. The worker can perform the operations and jobs and make judgements about them without this kind of information. When training or course time is limited, this kind of information is omitted. Sometimes the most closely related of general topics are included as part of the analysis so when teaching becomes more efficient and extra time is available, some of these topics can be included in course planning.	General Information is classed as nice-to-know, desirable, but not essential.
The basic knowing element of an analysis is the Related Information Topic. However, as you will see later, information can be in smaller or larger units than the basic topic size. Units of information smaller than the basic topic are called Information Points and units consisting of groups of topics in a single field are called Related Subjects. It is common practice in vocational programs to teach Related Subjects by a teacher different from the regular shop or laboratory instructor and usually in a room different from the laboratory.	Basic Knowing Elements Information Point Related Information Topic Related Subject
12. To Write An Information Topic Title Make the title descriptive Avoid starting with a verb as this form is reserved for doing element titles The participile form may be used for information topics explaining an operation Some examples of Related Information Topics are shown in the following slides. For these examples the topics are of the technical information kind.	SAMPLES OF INFORMATION TOPIC TITLES

AUDIO	VIDEO
Cabinetmaking	Cabinet Making
Machine Shop	Machine Shop
Cosmetology	Cosmetology
Practical Nursing	Practical Nursing
13. The basic Work Habit elements of an occupation are important in vocational and technical teaching and are an important part of a complete analysis. However, time does not permit a discussion of these in this lesson.	
14. To this point in our study of analysis, this evening, you now have an understanding of the nature and purpose of an instructional analysis; especially, the knowing and doing elements of the process. You have seen samples of titles of real work elements and from these should be able to identify the same kinds of elements in your own occupations.	
During the remainder of this lesson, I will demonstrate the steps to follow in making an instructional analysis. These steps are the same for all occupations so by following these closely you should be able to go through the same procedure for your own field of work. You will have an opportunity in seminar-discussion to practice this technique for parts of your own occupation.	

AUDIO	VIDEO
However, before beginning the sequence of analysis steps, it is timely at this point to consider, "Who makes the instructional analysis?" Presently and for many years past experts such as yourself with a number of years experience in the occupation make the analysis soon after they begin their new work as a teacher for the occupation. Occasionally, experts in a field watch other experts at work and identify and record the essential elements in use and this is given to you as an analysis of the field. After you have been teaching for a while you may work with other teachers of the same subject in analyzing in more detail or updatin an earlier analysis. No instructional analysis can be complete at one time because of the rapid changes in work in business and industry.	
15. To make a minimum analysis to use in planning for teaching, the following five steps must be performed. 1. Block the occupation 2. Make master lists of elements 3. Make an analysis chart 4. Determine an order for doing elements 5. Determine an order for knowing elements The key words for these steps are shown on this chart.	ANALYSIS PROCEDURE 1. Block Occupation 2. Make master lists 3. Chart 4. Determine element order
The first step, in blocking an occupation is for convenience in making sure no part of the field is left out when searching for essential elements. It could also be used as you will see next week in determining course units. For now it is a convenience in guiding the search for elements. Some occupations cannot be logically subdivided and are called **single-block occupations**. Those fields of work that can be so divided are called **multi-block occupations**.	
Some examples of occupations blocked for analysis are shown on the following slides.	

AUDIO	VIDEO
16. The second task in making an instructional analysis involves making master lists of three kinds:	
1. Master List of Basic Operations A sample of this listing is shown on the following chart. Each operation title is correctly written and of course is a small piece of work needed in a number of jubs. If some of the operations listed cannot be used in a particular job, they are called auxilliary operations. An auxilliary operation is defined as one needed to keep production going; for example, To Sharpen A Twist Drill, Replace Meter Batteries, etc. Operations are listed in any order the first listing. Order these in teaching is established later in the charting procedure.	Master List-Operation (How to:)
2. Make Master List of Common Jobs Just as for the operations these are written in correct form but not in any order the first time listed. These are the larger pieces of work that will be used in teacher planning later as vehicles through which the basic operations will be practiced.	Master List-Jobs (How to:)
3. Make Master List of Information Topic Titles For your first listing, make these all technical and guidance kind of topics. Because these topics will be chosen to relate to the operations and jobs they can be given an order later when an order is established for the basic operations.	Master List Related Information
All of these elements in these three lists are obtained by reflecting on the worker in the occupation block-by block if a multiblock trade, or for the complete occupation if a single-block field of work.	
A complete analysis of an occupation would also include another master list of basic work habits of a good worker in this occupation. This will not be included in this short lesson.	

AUDIO | **VIDEO**

17. After instructional elements have been listed, information about the elements as to their frequency of use, relative importance and other factors can be gained through the charting procedure. Specifically, these factors can be learned.

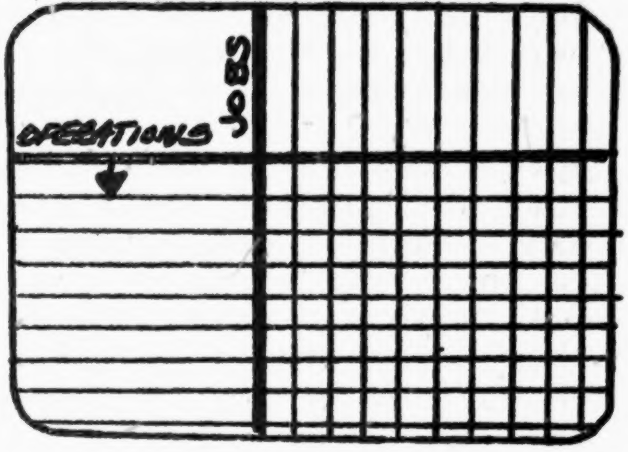
1. Frequency of use of operation
2. Simplicity and complexity of jobs
3. Order and grouping of operations
4. Order and emphasis of Information topics

CHARTING TO FIND:

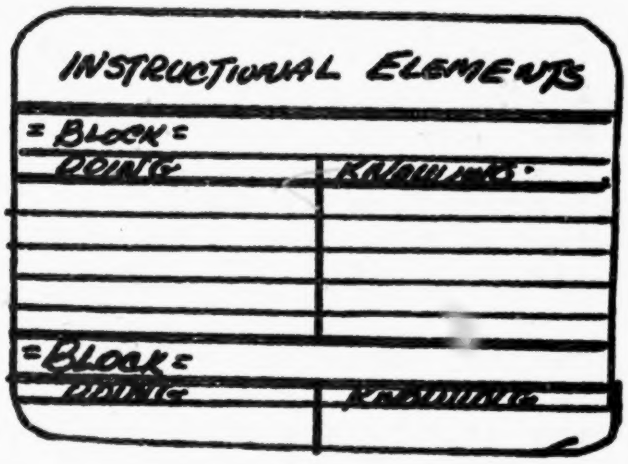
1. Operation Frequency
2. Job Complexity
3. Operation Order
4. Information Topic Order

Analysis charts as tools of the analyist for information about instructional elements are of two typed:

1. Grid kind of chart
2. Two-column Chart

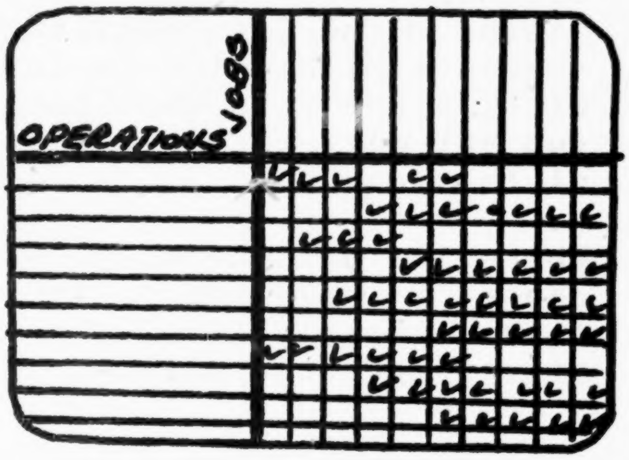


Note this two kinds in the illustration, The grid chart is most valuable for custom occupations, while the column chart provides most information for the service occupations. Custom occupations are those fields of work in which the worker produces a product in contrast to the service fields where the worker produces a service. For example: the carpenter and cabinetmaker are in custom occupations because their work results in tangible structures or products, whereas the automotive technician produces a service. The cosmotologist and barber produce products in the form of haircuts and permanent waves and are in a custom occupation while the practical nurse produces a service.



18. To Make A Grid Type Analysis Chart:

1. Procure graph paper and rule as shown
2. Label vertical column, Basic Operations (How to)
3. Label horizontal spaces, Jobs
4. List job and operation titles in the appropriate spaces. (any order first time)
5. Check each operation if used in the common job (checks will not have pattern at this time).



AUDIO

6. Rearrange both order of operations and jobs to obtain a pattern of checks as shown.
7. Number operations and jobs in the new order.

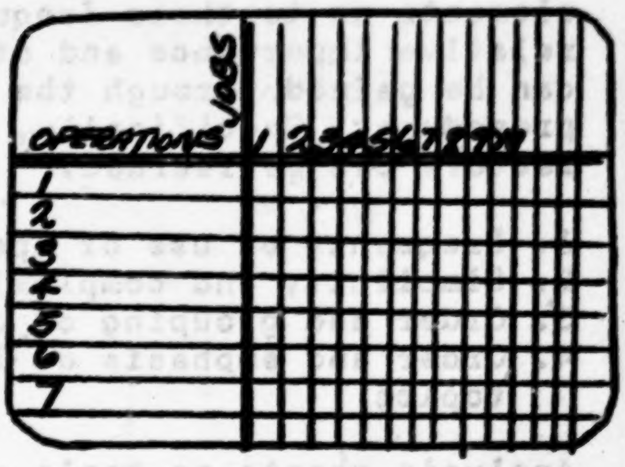
After rearranging jobs and operations to obtain the diagonal pattern of checks and then numbering the operations and jobs as shown, these two kinds of elements are then in order for teacher planning. The highest frequency of use operations take the lowest number. The jobs range from the simple(lowest number job) to the comples. When a group of operations tend to be used with many simple jobs, the whole group of operations is called the block base. When you get to course planning, the block base of operations will appear in the early units of the course. You will also see later the grid analysis chart when ordered can with slight changes be used as a student progress chart.

After operations are ordered, the information topic titles are ordered by inspection and rearranged in order to most closely relate to the order for the operations. After the best order combination is found the information topics are then numbered in the same order as the operations.

Further analysis within information topics will be necessary at the time the topics are prepared for the daily lesson. The topics will need to be organized around some pattern of outlining of the information points and concepts within the topics. A study of this analysis will be part of the subject matter by Dr. Moss in Unit 6 of this course.

Where the grid type analysis chart cannot be used for information about instructional elements as in many kinds of service occupations, the two -

VIDEO



AUDIO	VIDEO

column analysis chart is used. As can be seen in the illustration doing elements (operations) and knowing elements (information topics) are considered at the same time and placed in vertical columns.

Start this kind of a chart by first considering opcupation blocks and then separately for each block list the operations in a vertical column with an order of frequency of use determined from your knowledge of the field. After these are placed in the best order, number them from the top down in the same manner as for the grid chart. Information topic titles from your master list are then placed in another vertical column adjoining the doing column. The topics are ordered so as to get technical and guidance kinds of information topics closest to the operations to which they relate. Upon completion of this chart we have available for later course planning blocks of the occupation, order of operations, and order of information topic titles.

20. And now in summary- these technical information points.

(1.) During this lesson we have studied the instructional analysis technique as an inventory of essential elements needed for planning for instruction.

(2.) We have seen in detail how the essential elements, doing, knowing, and being as behavior have their base in a definition of learning as a change in behavior.

(3.) Also we have seen that the actual work titles for the doing, knowing, and being elements are the operation, the related information topic, and the work habit statement.

(4) From lists of titles of instructional elements, we have charted the elements by means of two kinds of charts. We used grid charts for custom occu-

AUDIO

pations and column kinds of charts for custom for service. Further, from the kinds of charting we were able to get information as to importance of frequency of use, and order of presentation for teaching.

(5.) As we have proceeded through this lesson, you have noted many comments about the use of information gained from an analysis for planning for teaching. Also you have developed an awareness of the fact that no analysis is entirely complete at any one time, but rather an analysis must be continous to follow the changes in industry and business.

This concludes our study of analysis for this course. Next week's lesson is entitled, Organizing Course Components. In that lesson, I shall show in detail the planning of the various parts of a course of instruction. I will give considerable attention to the establishing of course objectives and their clarification using information gained from the instructional analysis.

Until next week, goodnight, and see you at the same time.

ADDENDUM

And now for a general information topic

The instructional analysis technique we have been studying is the most popular of ways to determine and select instructional content for technical fields. It had its beginning during World War I in the work of two people; Charles Allen, an educator; and Robert Salvidge, an engineer. The first text was used for development of military training programs and by 1923 carried the title, "How to Teach a Trade". Simplification and improvement of the technique by Fryklund resulted in a new text, "Trade and Job Analysis". In this form the analysis procedure was widely used for the development of training courses for World War II. The technique in its earliest form was translated for use in

VIDEO

How to
Teach
A
Trade

Trade
and
Job
Analysis

AUDIO	VIDEO
development of foreign vocational programs. Fryklund's text was translated into five languages for foreign vocational program development. The 1965 revision of the text under the title, "Analysis Technique for Instructors" carries the same basic technique with illustrative examples from more fields.	Analysis Technique for Instructors

UNIT	ORGANIZING COURSE COMPONENTS
3	SUMMARY OF FILM PRESENTATION

This summary of Unit 3 is planned for student use before viewing the film presentation. It is suggested that this preview outline be given to students at the end of Unit 2 as indicated in the "Method of Approach" for Unit 2. In addition to a preview, the outline can also serve as review notes for this unit. The information outlined in blocks of the outline is a duplicate of charts used during the Unit 3 film presentation.

Unit 3 - Summary Review

I. Analysis Review

A. Definition of Analysis

An instructional analysis is a technique whereby the essential elements of an occupation are identified and listed for instructional purposes.

B. Definition of Learning

Learning is a change in behavior through experience.

C. Review of instructional element as used in Unit 2

Learning Behavior	Basic Instructional Element
Doing	Operation
Knowing	Related Information Topic
Being	Work Habit

II. Key Points in Planning for Teaching

A. What - aims and purposes - objectives - content
B. How - teaching methods and resources
C. Check - evaluation of teaching and learning

III. Cource Components

A. Orientation
B. Broad Course Objectives
C. Clarified Course Objectives (content)
D. Course Units
E. Unit Lessons
F. Course Evaluation

IV. Course Unit - Definition

A course unit is a major subdivision of a course and consists of selected specific clarified course objectives (content) tied into a meaningful whole with teaching procedures aimed at achieving the objectives.

UNIT	SUMMARY OF FILM PRESENTATION (CONT'D)
3	ORGANIZING COURSE COMPONENTS

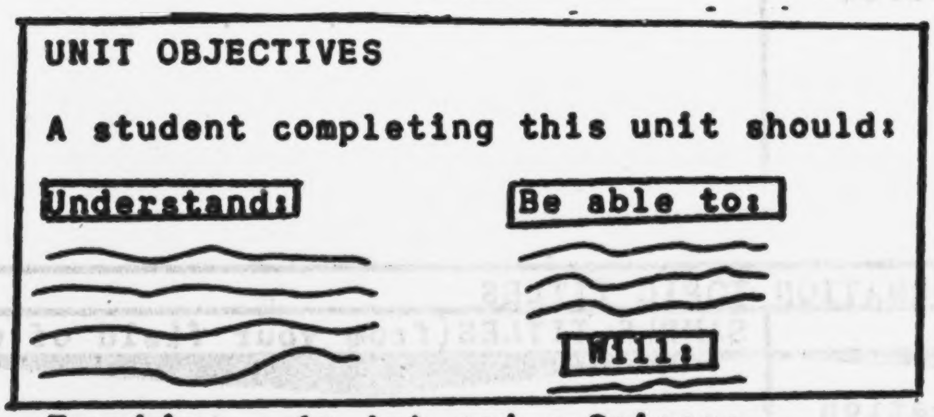
V. Course Unit Components

- A. Introduction
- B. Unit Objectives
- C. Teaching Expendients
- D. Method of Approach
- E. Unit Evaluation
- F. Unit Appendix (unit resources)

VI. Unit Objectives

- A. Chosen from master list for whole course
- B. Written in behavior change characterizations
- C. Usually contain content in the three areas of behavior
- D. Needed for both development of teaching procedures and unit evaluation

VII. A Form for Unit Objectives



UNIT OBJECTIVES

A student completing this unit should:

Understand:

Be able to:

Will:

VIII. Teaching - An Art and a Science

- A. Determination of objectives - a concensus and agreement process.
- B. Teaching for objectives - science from the point of view of principles of learning and teaching.
- C. Teaching for objectives can be an art and make use of the creative talents of the teacher.

UNIT	PRACTICE SHEET-ELEMENT TITLES
2	ANALYZING FOR INSTRUCTION

PRACTICE -OPERATION OR PROCEDURE DOING TITLES

OPERATION CRITERIA	SAMPLE TITLES(from your field of work)
(1) Relatively constant over long time periods and in different geographical locations (2) Small complete pieces of work with little use by themselves - Used in combination to produce larger pieces of work called jobs. (3) Always involve steps of procedure and the steps have order (4) A distinct unit of work and can be learned without reference to any particular job	

PRACTICE -RELATED INFORMATION TOPIC TITLES

KINDS OF TOPICS	SAMPLE TITLES(from your field of work)
(1) TECHNICAL - Information the workman must know to form judgements in his work (2) GUIDANCE - Information needed for progress on the job (3) GENERAL - Information nice to know, desirable, but not essential	

UNIT	PRACTICE-CHARTING
2	ANALYZING FOR INSTRUCTION

ANALYSIS CHART FOR ____________________ BASIC OPERATION OR BASIC PROCEDURES (How To;) COMMON JOBS																	

UNIT	TEACHER REFERENCES
2	ANALYZING FOR INSTRUCTION

References:

A. Fryklund, Vern C., Analysis Techniques for Instructors, Milwaukee: The Bruce Publishing Co., 1965.

B. Jackey, Donald F., and Barlow, Melvin L., The Craftsman Prepares To Teach, New York: The Macmillian Co., 1944.

C. Rose, Homer C., Development of Supervision and Training Programs. Chicago: American Technical Society, 1964.

D. Selvidge, R.W., How to Teach a Trade, Peoria, Illinois: The Manual Arts Press, 1923.

E. Selvuis, G.H. and Bohn, R.C., Organizing Course Materials, Bloomington, Illinois: McKnight and McKnight Publishing Co., 1961.

Micheels, William J., "The Analysis Technique", Industrial Arts and Vocational Education, December 1948.

Micheels, William J., "Course Building - An Overview", Industrial Arts and Vocational Education, 1949.

Unit 3

Organizing Course Components

TEACHER'S GUIDE

FOR

ORGANIZING COURSE COMPONENTS | UNIT 3

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining filmed presentations and seminar discussions designed to provide twenty-four clock hours of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 3 INTRODUCTION

The instructional analysis technique studies in Unit 2 while a vital and useful procedure, can produce only an inventory of small pieces of content with some ideas for instructional order. To be useful for the actual day-to-day teaching, the small instructional elements need synthesis and organization into a teaching plan. It is for this reason, therefore, this unit should logically follow Unit 2 and be kept in this order.

During the study of this unit, information obtained from the analysis will be needed to clarify teaching objectives and for planning the instructional materials, teaching methods, and evaluation procedures needed. It is obvious then that the study in this unit supplemented by the instructional analysis provides the base for all succeeding units in this course.

The seminar-discussion period coordinated with this unit should provide students with an opportunity to begin some development plans for their own teaching. In this way discussion will be enhanced and the course organization principles will take on more meaning and logic.

UNIT 3 | OBJECTIVES

A student achieving the broad objectives for this course as clarified for this unit should:

(1) Understand the first principles and concepts involved in developing course materials.
(2) Understand and be able to use vocational education terminology common to course organization principles and practices.
(3) Develop first appreciations and attitudes about teacher confidence and efficiency resulting from personally planned instructional materials.

The specific objectives (content) for attainment in this unit are:

STUDENT WILL UNDERSTAND: cognitive concepts, principles, generalizations

1. Planning for Teaching
   - A. Planning Purposes
   - B. Planning Outcomes
2. Definition of Terms
   - A. Curriculum
   - B. Course
   - C. Unit
   - D. Lesson
   - E. Objective
   - F. Content
   - G. Expedient
   - H. Evaluation
3. Vocational School Objectives
   - A. Marketable Skills
   - B. Functional Knowledge
   - C. Work Attitudes, Habits
4. Determination Broad Course Objectives
   - A. School Objectives
   - B. Advisory Committees
   - C. Analysis of Purposes
5. Course Development Components
   - A. Broad Objectives
   - B. Clarified Objectives
   - C. Course Units
   - D. Course Evaluation
6. Course Objectives as Desirable Behavior Changes
   - A. Knowledge Behavior
   - B. Skill Behavior
   - C. Work Habit and Attitude
7. Clarified Objectives as Course Content
   - A. Information Topic Titles
   - B. Skill Titles
   - C. Work Habit Statements
8. Uses for Clarified Objectives
   - A. Course Content
   - B. Course Evaluation
9. Course Unit Determination
   - A. Job-Project-Problem
   - B. Major Concepts, Principles, Generalizations
   - C. Student Interest
   - D. Subject Matter Structure
10. Course Unit Components
    - A. Unit Objectives
    - B. Teaching Expedients
    - C. Teaching Methods
    - D. Unit Evaluation
    - E. Unit Resources, Appendix
11. Unit Objectives
    - A. Selected From Course Objectives
    - B. Degree of Clarification
    - C. Objectives and Unit Evaluation
12. Unit Teaching Expedients
    - A. Teacher Expedients
    - B. Student Expedients
13. Unit Method of Approach
    - A. Teacher Approach
    - B. Student Activity
14. Unit and Course Appendices
    - A. Unit Appendix and Resource Units
    - B. Teacher Expedient Storage
    - C. Enrichment Materials
15. Course and Unit Evaluation
    - A. Purposes
    - B. Kinds of Instruments
    - C. Quality of Instruments
16. Course of Study in Use
    - A. Student Syllabus
    - B. Curriculum Director
    - C. Teaching-Learning Improvement

UNIT 3 | LESSON MATERIALS

The following teaching materials to help you with the teaching of this unit are included in this resource appendix. You will want to duplicate the number of necessary copies to use as you lead the seminar discussion.

Materials

A. The thirty-minute film, "Organizing Course Components" may be obtained from the Director, Vocational Section, State Department of Education, Centennial Building, St. Paul 55101.

B. Script of Film, Organizing Course Components.

C. Summary of Film Presentation.

D. Unit 3 Test.

E. Unit 3 Test Answer Sheet.

F. Unit 3 Test Answer Sheet Key.

G. Overview Chart of Course Development.

H. Overview Chart of Course Unit Development Pages.

UNIT 3 | SUGGESTED METHOD OF APPROACH*

DISCUSSION LEADER	STUDENT ACTIVITY
1. Introduce unit with "Summary of Film Presentation" hand-out sheet (Smaple for duplication in the unit appendix). Advise students that this summary eliminates the need for taking notes during the film viewing and that it can also be used later as review material.	1. Study summary sheet for the charts shown and the kind of items summarized.
2. Arrange for film viewing, either individually or for the group.	2. View film.
3. Give Unit 3 Test (copies of tests and answer sheets should be duplicated from samples in the unit appendix).	3. Complete test answer sheet (no time limit). Make notes on answer sheet for later discussion.
4. Provide test answers.	4. Correct answer sheet. Mark test scores on the progress chart by code number. (Instructor will provide the code numbers.)
5. Initiate discussion from student notes on the answer sheet.	5. Return answer sheets to instructor after the discussion.
6. Review and show samples (if possible) of a course syllabus for students, a course outline, and a teaching guide sample.	6. Identify the main differences in these three kinds of teacher course guides.

*The same approach can be used for one student or a group of students. While this approach is a suggested one, it is suggested also that the teacher for whom this content is new follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 3 | SUGGESTED METHOD OF APPROACH

Continued ------

DISCUSSION LEADER	STUDENT ACTIVITY
7. Review main parts of a teaching guide.	7. Identify pertinent parts of a teaching guide from teacher samples provided.
8. Review detail of a course unit within a teaching guide.	8. Identify pertinent parts of a course unit from samples provided.
9. Initiate discussion about the value and time-saving features of a teaching guide. (Be ready for student questions about teacher time needed for teacher guide development.)	9. Students list the ways in which a well organized teaching guide can be of value to them.
10.* Introduce next course unit and hand out copies of "Summary of Film Presentation" for Unit 4.	

*This summary sheet may be given at the end of this unit for between class session study or at the beginning of the Unit 4 session.

UNIT 3	UNIT RESOURCE APPENDIX ORGANIZING COURSE COMPONENTS

RESOURCE MATERIALS

- **A. Unit Test**
- **B. Unit Test Answer Sheet**
- **C. Unit Answer Key**
- **D. Film Script**
- **E. Film Summary**
- **F. Chart - Overview of Course Development**
- **G. Chart - Overview of Course Unit Development**

UNIT	UNIT EXAMINATION
3	ORGANIZING COURSE COMPONENTS

Directions: This examination is designed to evaluate your learning for the formal video or film presentation part of this unit of study. Answer each item by darkening the appropriate letter as shown by the example on the answer sheet. All answers are recorded only on the answer sheet. Do not make any marks on this test form.

1. Industrial and business names for instructional analysis elements are:

   A. technical-guidance-general
   B. jobs-operations-procedures
   C. knowing-doing-being
   D. course-unit-lesson

2. One of the following factors is not a part of the organizational pattern of planning for teaching.

   A. objectives-goals
   B. means-resources
   C. testing-evaluation
   D. principles of learning

3. Considering organized teaching plans in terms of the amount of content to be covered, the smallest unit is:

   A. the course of instruction
   B. the course unit
   C. the unit lesson
   D. the operation or procedure step

4. The most specific and detailed of planning objectives are the:

   A. school objectives
   B. course objectives
   C. course unit objectives
   D. unit lesson objectives

5. One of the following is not a main course component.

   A. broad course objectives
   B. clarified course objectives
   C. course instructional aids
   D. course evaluation

6. One of the following is not a name for an outline or plan for teaching a course or unit.

   A. course syllabus
   B. resource unit
   C. course outline
   D. teaching guide

7. One of the following is usually not included in a course orientation or course introduction.

   A. teaching expedients
   B. age and nature of students
   C. previous experience of students
   D. general overall course aim

8. Broad course objectives for the kinds of courses planned for vocational and technical instruction usually:

   A. can be stated on one page
   B. are stated in terms of actual operations and information topics
   C. should be detailed enough for final examination development
   D. should evolve from unit objectives

9. One of the following is usually not given first emphasis for vocational or technical school objectives.

   A. marketable skills
   B. functional knowledge
   C. general values
   D. work habits

10. Course Units are:

    A. main course subdivisions
    B. lesson subdivisions
    C. subdivisions of the curriculum
    D. the daily lessons as units

UNIT	UNIT EXAMINATION
3	ORGANIZING COURSE COMPONENTS

CONT'D

11. One of the following would not be very useful in stating clarified course objectives as desirable behavior changes.

A. should understand............
B. should learn.................
C. should be able to...........
D. should act...................

12. Course units are determined in a number of ways. One of the following would be most illogical and inefficient.

A. common core of jobs or operations
B. major principles, theories, or concepts
C. logical divisions of the subject
D. nearly equal blocks of time

13. The component part of a course unit that differs from the parts for a whole course is the:

A. unit introduction
B. unit objectives
C. unit method of approach
D. unit evaluation

14. Unit objectives differ from broad or general course objectives in that they:

A. take into account the three kinds of learning behavior
B. specify learning behavior in actual work element titles
C. take less time to write
D. are not as clearly defined

15. Regarding course lessons, it can be said they:

A. provide the overall goals for the whole course
B. are the smallest organized component of the whole course
C. usually should be 3 to 5 class periods in length
D. need not be as highly structured as other course components

16. A unit "Method of Approach"

A. could be a series of planned lessons
B. usually includes only "knowing" kinds of elements
C. always is the first step in course unit development
D. determines unit objectives

17. Another name that could be given to the "unit appendix" is the:

A. unit teaching expedients
B. unit resources
C. unit evaluation
D. unit analysis

18. A unit appendix differs from a course appendix in that:

A. unit appendices contain all of the information from an instructional analysis
B. a course appendix is useful for ordering materials and supplies
C. unit appendices contain samples of shop personnal organizations
D. course appendix contains samples of teaching hand-out materials

19. The instructional analysis is a most useful tool for:

A. determining broad course objectives
B. clarification of broad course objectives
C. planning a lesson
D. development of test instruments

20. Teaching is both a science and an art. The art part in teacher planning is most reflected in:

A. unit objectives
B. teaching expedients
C. unit evaluation
D. overall objectives

UNIT	ANSWER SHEET - UNIT EXAMINATION
3	ORGANIZING COURSE COMPONENTS

Name ______________________ Code No. ______________

Date ______________________ Score ______________

Discussion Leader ______________________

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

Before you begin the examination or while you are waiting for others to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

UNIT	ANSWER KEY - UNIT EXAMINATION
3	ORGANIZING COURSE COMPONENTS

Name
Date
Discussion Leader

ANSWERS	INSTRUCTOR NOTES

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	●	○	○
2.	○	○	○	●
3.	○	○	●	○
4.	○	○	●	○
5.	○	○	●	○
6.	○	●	○	○
7.	●	○	○	○
8.	●	○	○	○
9.	○	○	●	○
10.	●	○	○	○
11.	○	●	○	○
12.	○	○	○	●
13.	○	○	●	○
14.	○	●	○	○
15.	○	●	○	○
16.	●	○	○	○
17.	○	●	○	○
18.	○	●	○	○
19.	○	●	○	○
20.	○	●	○	○

UNIT	DR. WILLIAM A. KAVANAUGH
3	ORGANIZING COURSE COMPONENTS

AUDIO | **VIDEO**

Good Evening.

Welcome to the third lesson of Introduction to Vocational-Technical Teaching. I am William Kavanaugh, your instructor for tonight's lesson, Organizing Course Components. This is a continuation of the teacher planning part of your course.

You will recall from last week's study that we looked into an occupation and fields of work searching for essential elements relating to the nature worker and his work. We called the searching and inventory process the Instructional Analysis Technique and the resulting inventory of lists, charts, and other occupational information the Instructional Analysis.

REVIEW--
AN INSTRUCTIONAL ANALYSIS IS A TECHNIQUE WHEREBY THE ESSENTIA ELEMENTS OF AN OCCUPATION ARE IDENTIFIED AND LISTED FOR INSTRUCTIONAL PURPOSES

Because we had in mind later use of the occupational information about elements for a teaching purpose, we listed the elements in the form of knowing, doing, and being. Also, because we defined "Learning" in our last lesson as a change in behavior and used doing, knowing, and being as kinds of learning behavior, we used the same names for our analysis elements.

REVIEW--
LEARNING IS A CHANGE IN BEHAVIOR THROUGH EXPERIENCE

During the last lesson we quickly converted from doing, knowing, and being behavior elements to industrial terminology for the names of the actual work elements used. These were:

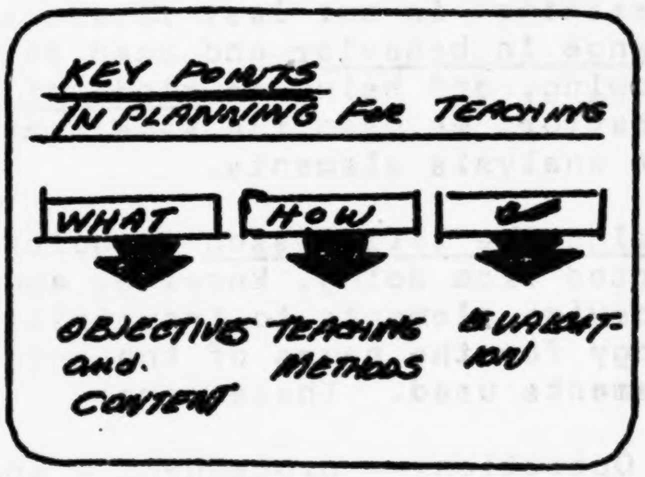
1. Operations - procedures - and jobs - for Doing
2. Related Information topics, subjects and points for Knowing elements and
3. Work habits, attitudes, and appreciations for Being elements.

REVIEW

LEARNING BEHAVIOR	INSTRUCTIONAL ELEMENT
DOING	OPERATION
KNOWING	RELATED INFORMATION TOPIC
BEING	WORK HABIT

Last time we also cautioned you against thinking that these were the only ways in which learning could be classified, but that was a functional scheme and widely used by public vocational school

UNIT	ORGANIZING COURSE COMPONENTS
3	PAGE 2

AUDIO	VIDEO
teachers and by other instructors in training programs in business and industry.	
In last week's lesson we were most concerned about taking apart and looking for teaching elements. In tonight's lesson, we will be most concerned with synthesis or the putting together in an organized teaching plan, the elements found during analysis procedures and selected for teaching.	
Before beginning our discussion about organizing the various parts of a course of instruction, think for a minute about one organizational concept that is the basis for all of our planning.	
All organizing for teaching means planning and arranging and can be summarized around three key points:	
(1st) Plan - What should students learn in a course you are organizing for teaching? This is the "What" part of planning and will get us into detail about an overall objective, broad and general kinds of objectives, and clarified or very specific objectives.	 KEY POINTS IN PLANNING FOR TEACHING WHAT HOW ✓ OBJECTIVES and. CONTENT TEACHING METHODS EVALUAT-ION
(2nd) Plan How to do the teaching job with the best organizational plan and most appropriate means and resources. So students will learn what we have specified under point 1, and this gets us into unit and basic development and teaching methods and resources.	
(3rd) Plan - Plan for a check or an evaluation to see if students have learned or if you as a teacher have taught what was specified under point 1. This point of ours takes us into a study of evaluation instruments.	
This principle is basic and will show up in each of the component parts of course planning.	

AUDIO

To begin our study of course organization, follow again the basic steps in course planning, first in overview and then in detail.

1. Plan the Orientation
   This is the setting for the course; overall purpose; age of students; running time of course; etc.

2. Determine Broad Course Objectives
   This is a series of statements about the general ends the teacher hopes the students will attain.

3. Clarify Broad Course Objectives
   These are very specific clarifications of the broad objectives and with enough detail, clarity, and definiteness that there is no question about what students should be learning. If clarified objectives are clear enough there should be no question about what to measure to evaluate student learning.

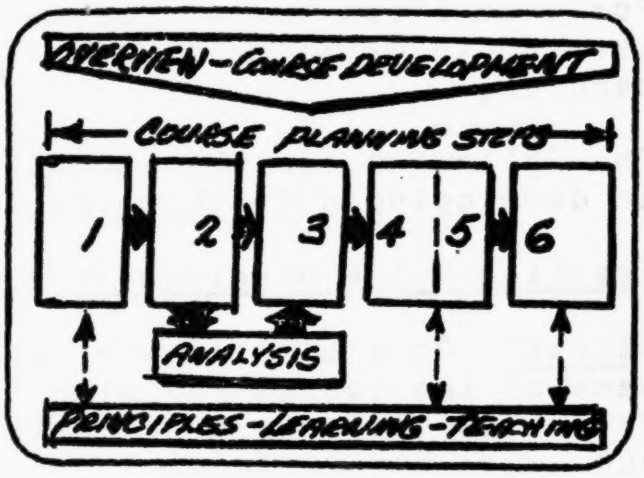
4. After the above step, the teacher could plan either the course units or the final examination instruments.

5. Plan the Course Units
   These are major subdivisions of the course running from one week to maybe two or three weeks. All of the course units should accomplish all of the clarified objectives for the whole course.

6. Make Lesson Plans
   These are the smallest divisions of a course that have unity and generally are more than one basic element.

You will note that steps 1, 2, 3, and 4 were all concerned with the "what" part of teacher planning. Steps six and seven were concerned with the "how" of teacher planning and development. Evaluation or check was a part of block 5.

VIDEO


OVERVIEW - COURSE DEVELOPMENT
COURSE PLANNING STEPS
1
2
3
4
5
6
ANALYSIS
PRINCIPLES - LEARNING - TEACHING

1 - COURSE ORIENTATION
2 - BROAD COURSE OBJECTIVES
3 - CLARIFIED COURSE OBJECTIVES (CONTENT)
4 - COURSE UNITS
5 - UNIT LESSONS
6 - COURSE EVALUATION

AUDIO	VIDEO

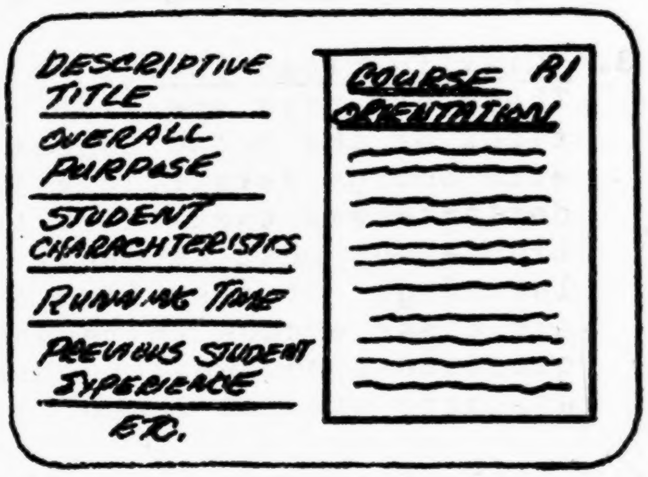
A complete plan for a course you will teach could be called a: (1) Course Outline, (2) Course Syllabus, or (3) Teaching Guide, depending on the format you use and the degree of detail included in the plan.

For your first course planning I will present in detail a step-by=step procedure.

The following are the steps to perform in developing a teaching guide.

Teaching Guide Development Procedure:

(First) On a single page, write the name of the course you plan to teach. Make this title as descriptive as you can. For example:
Building Construction Drafting is better than General Drafting II.



Business Data Processing or General Data Processing is better than just Data Processing

Hotel Chef Training - better than Foods I or II.

Agricultural Machinery Repair

Machine Shop better than Metalworking I.

Business Data Processing or
General Data Processing
Medical Office Receptionist

After a descriptive title, include statements specifying:

The overall purpose or one aim for the course:
Nature of the students; age, typical group, or special group
Running time for the course: months clock hours, weeks, sessions
Laboratory, shop classroom time arrangements
How much of this work have the students previously had: beginning, advanced, or special kind of course

AUDIO

All of this information usually on one page by beginning teacher planners constitutes the Orientation for the Course.

(Second) On a single page write this title - Broad Course Objectives. Follow with this statement: "A student completing this course should:"

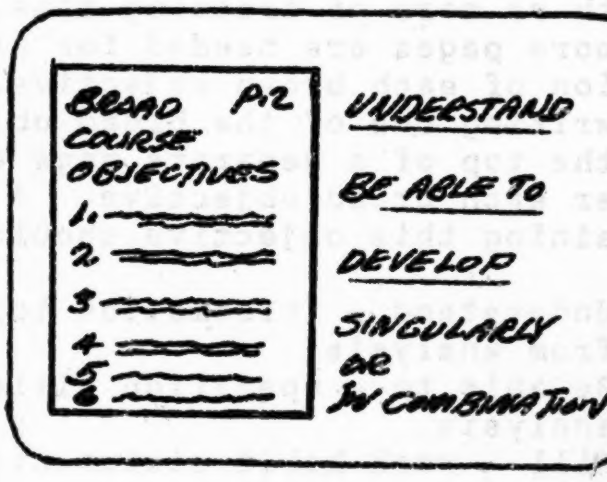
1. Understand the ____________________
   ____
2. Be able to ______________________
   ____
3. Develop desirable ________________
   ____
4. Understand and practice the accepted safety practices
5. Be able to read and interpret related drawings and sketches
6. Understand and practice preferred business ethics.

Note that some of these objectives are knowledge oriented, others skill centered, some work habit and attitude emphasis, and some a combination of the three behaviors. The important thing about these objectives is that when clarified and taught for a marketable worker of high calibre should result.

Usually the broad objectives for the fields in which most of you will be planning courses can be stated in five to eight broad objectives.

The statement of broad course objectives is a most important part of course planning. It does not require a lot of writing. The language used should be simple and definite. This makes it easy. Yet it is difficult to get beginning teachers to do this part of planning. The teacher's argument for this is that they are just so many words written to impress others and what good are these objectives anyway? If broad course objectives aren't deliberately used by the teacher they might have a good right to feel this way.

VIDEO



AUDIO

On several pages Clarify Broad Course Objectives.

For courses of any reasonable length, month or more of training time, one or more pages are needed for clarification of each broad objective. Begin by writing one of the broad objectives at the top of a separate page and under each broad objective. A student attaining this objective should:

1. Understand - information topic titles from analysis
2. Be able to - operation titles from analysis
3. Will - work habit statements from analysis

A broad objective can probably be most easily clarified by asking yourself a question, "What should the student be like when he has attained the objective?" "What will he understand?" "What will he be able to do?" "How should he act with respect to safety, and other work habits, attitudes, and appreciations?"

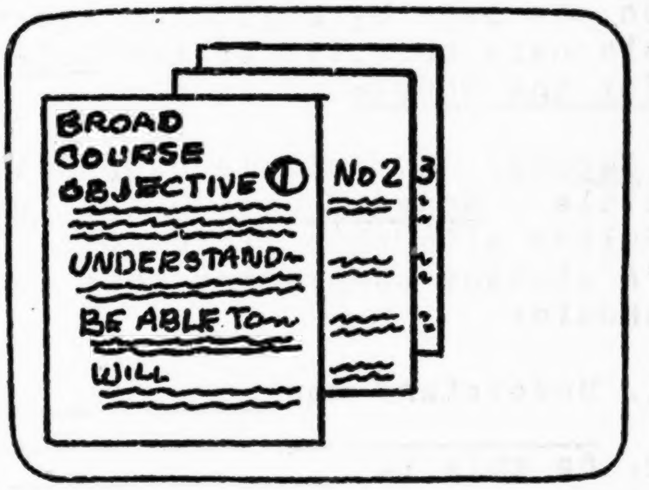
The answer to these questions is readily available from the instructional analysis. This is why you performed this task. If the answers aren't in the lists and charts you have made, the analysis needs some additions. Of course within the time period of the course not all information topics, or all skills, or all work habits can be learned, so there must be selection. The frequency of use and simplicity and complexity from the analysis will be of help in making the selection.

How will you know when an objective is clarified in enough detail? When is it functional for planning the rest of your course?

Two checks you can use:

1. When it is clear enough that you can choose a teaching method and teaching aids and learning experiences so it will be learned.

VIDEO



AUDIO	VIDEO

2. When it is clear enough that you can make an evaluation instrument, written test, performance test, observation check sheet, or other device to determine if it has been learned.

When broad course objectives are clarified to this point they become course content, and provide the content that you will expect students to learn. Because the content came from two directions, analysis of the worker and his work and the agreement with course objectives, attainment of the objectives to an acceptable degree should result in a marketable worker product.

All of the work you have done for the pages of your teaching guide so far has been to answer the question, "What should students learn?" Also all of the written pages for your guide so far are in small pieces and not coordinated. To this point you know only what students should learn. "How" will come next.

Probably the most inefficient, illogical, and difficult way to teach for the body of content developed would be to start from the beginning of one of the pages of clarified objectives and one by one start explaining for the knowing elements, demonstrating for the skill elements, and preaching for the work habits, and end up nine months or 180 class days later with everything covered.

This sometimes happens when a teacher continues through a textbook page by page and in order and the objectives of the author in writing the text were not the same as those planned by a teacher for a particular course.

The whole body of content (clarified objectives) can be more easily managed and organized if a smaller part of it is organized around Course Units. Course units are major subdivisions of the course.

AUDIO

Defined - An instructional unit is a group of clarified objectives tied together into a meaningful whole and coordinated with teaching means and resources.

Course Units are Determined in a Number of Ways.

A course unit is a major subdivision of a course and for most vocational courses consist of usually a week's work for short units to two or three weeks for the longer ones. There is no specified length. If it is too short it becomes probably a lesson; if it gets too long, it becomes a short course in a curriculum. Determining length of a unit and what objectives are selected from a list of objectives for the whole course is the task in unit development.

However, some pointers may help:

1. Units may be planned around a common core of operations - Maybe, the block base from the analysis.
2. Common service jobs - in the locality.
3. Major principles, theories, or concepts.
4. Logical divisions of the subject itself.
5. Same blocks as used for the beginning of-the analysis.

Make a page of Unit Titles.

Unit 1 - Introduction to Work of the Cabinet Maker
2 - Basic Cabinet Making Operations
3 -
4 -
5 -

Develop each unit.
This will be a written guide for teaching the content of the unit and:

VIDEO

A COURSE UNIT - - - - - - -

IS A MAJOR SUBDIVISION OF A COURSE AND CONSISTS OF SELECTED COURSE CLARIFIED OBJECTIVES (CONTENT) TIED TOGETHER INTO A MEANINGFUL WHOLE WITH TEACHING PROCEDURES AIMED AT ACHIEVING THE OBJECTIVES.

AUDIO	VIDEO

It will contain the following pages:
(1) Unit Introduction
(2) Unit Objectives
(3) Teaching Expedients
(4) Method of Approach
(5) Unit Evaluation
(6) Unit Appendix

Note: The development of the unit follows the organizing pattern set for the whole course. Know what to teach - Unit objectives - Use the best method to get the job done - Check to see what has happened.

Unit Introduction
Places this unit in relation to other of the course units. It usually includes running time for the unit and other special features.

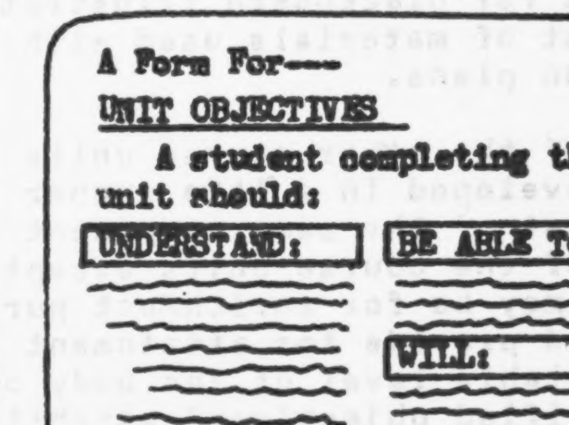
Unit Objectives
Are chosen from the master list of clarified objectives for the whole course and usually are coded. These are best kept in behavior changes form.

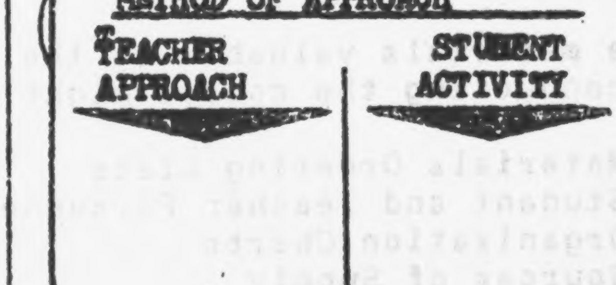
Teaching Expedients
Are means and resources needed to do the actual teaching to accomplish the unit objectives. Not always can this be completed in this order. And sometimes this step must be skipped over in part and then completed after lessons within the unit are planned.

Method of Approach
This is the actual plan of what topics are being presented and in what order and also the skills to be demonstrated and coordination of practice, jobs, and projects. It is a running order of topics of information to be presented by some method, and practice to be provided by the teaching method and learning experience. Exactly how to do this is study for Unit 4, the next lesson. The unit method of approach orders information topics and

UNIT COMPONENTS

1. INTRODUCTION
2. UNIT OBJECTIVES
3. TEACHING EXPEDIENTS
4. METHOD OF APPROACH
5. UNIT EVALUATION
6. UNIT APPENDIX
(Unit Resources)


A Form For---
UNIT OBJECTIVES
A student completing this unit should:
UNDERSTAND:
BE ABLE TO:
WILL:


METHOD OF APPROACH
TEACHER APPROACH
STUDENT ACTIVITY

AUDIO	VIDEO

operation titles with teaching methods and in sequence from the first to the last day of the unit.

Unit Evaluation
Following the organizing pattern set at the beginning of this television presentation, unit evaluative tests and instruments can be made right after unit objectives are recorded and before the Method of Approach is determined or any lessons planned.

Unit Appendix

This is comparable to a resource unit and is a place to store ideas, plans, sample of hand-out materials, lesson plans, sample instruction sheets, plans for blackboard illustrations, and a host of materials used with the lesson plans.

All of the other course units would be developed in a like manner and consist of the same component parts - all of the course units except any that may be for enrichment purposes should provide for attainment to an acceptable level of the body of content (clarified objectives) established for the whole course.

One additional part is usually added to a course teaching guide. This is the course appendix. It differs from unit appendices in that it refers to the complete course and contains materials relevant to all units.

Some materials valuable to the teacher in conducting the course might be:

1. Materials Ordering Lists
2. Student and Teacher Personnel Organization Charts
3. Sources of Supply
4. Local Companies Willing to Handle Field Trips and Industry Helps for You
5. New Ideas to Develop for Teaching in Certain Course Units

AUDIO	VIDEO

6. Materials and Ideas to Consider for Improvement of Course and Instruction
7. Analysis Information about the Work or Subject Matter

In summary:
(These Technical Information Points)

(1) In this lesson I have presented in overview the component parts of a plan for a teaching guide.

(2) I have discussed the importance of broad objectives in setting the general ends to be achieved for any course.

(3) I have shown how broad course objectives can be clarified with the information from an instructional analysis so they become functional and become course content.

(4) I have proceeded through the pages of a teaching guide so that you can, during seminar discussion, start a plan for your own course.

(5) I have shown samples of a course unit with pages for objectives, teaching expedients, but not the individual lesson plans. This will be the subject for your study with Dr. Moss next time.

(6) I have used one organizing principle; what, how, check, for a complete course and a course unit and the same principle will apply in your work next time.

This concludes our study of organizing course components for this lesson. Next week's presentation is "Planning the Lesson." In this lesson you will be working and planning with lesson materials. Good night for now. Dr. Moss will be with you for your next lesson.

AUDIO	VIDEO
Addendum And now for a general information topic. Planning for teaching and the actual teaching itself is both a science and an art. Selection of teaching elements from an instructional analysis and the determination of broad and clarified objectives is part of the science of planning for teaching - in other words, "What to teach?", important as it is, can be cut and dried and does not use to the most creative abilities of the teacher. The "how" part of teaching, the classroom presentations of principles, concepts, information, can be handled in a creative fashion when the teacher uses his best talents and insights to make understanding most efficient for most students. The cleverness with which the teacher can foresee understanding problems and plan creative ways to circumvent them is the art part of teaching - the good teacher uses both the science part of teaching and his own creative talents for the art of teaching.	

UNIT	SUMMARY OF LESSON 5 FILM PRESENTATION
4	TEACHING FOR UNDERSTANDING

I. Review of Lesson 4

A. Organize the content elements in the course outline into "doing" and "knowing" lessons.

Course Outline

Unit A	5	Lesson 1
	6	Lesson 2
	3	Lesson 3
	4	
Unit B	1	Lesson 4
	2	
	12	Lesson 5
	13	
Unit C	7	Lesson 6
	8	
	9	
	10	
	11	Lesson 7
	15	Lesson 8

B. State lesson objectives in terms of the lesson content.

C. Provide for 4 stages in teaching the content of each lesson - preparation, presentation, try-out, follow-up.

II. Methods used in the conduct of knowing (informational) lessons

A. Illustrated lecture method.

1. In this method the teacher tells the students what he wants them to learn, and supplements his verbal explanation with visual aids.

2. Visual aids serve to clarify, reinforce and reinterpret what the teacher says.

UNIT	SUMMARY OF LESSON 5 FILM PRESENTATION
4	TEACHING FOR UNDERSTANDING CON'T

3. Illustrated lecture method may be used:

    a. With a homogeneous group - students are sufficiently alike in their backgrounds and abilities so all will profit to a reasonable degree from the same presentation given at the same time.

    b. In the preparation and presentation stages of informational (Knowing) lessons.

B. Discussion method.

1. In this method the teacher poses a realistic problem or question to the class as a whole which requires them to use (apply) the new informational content of the lesson. The teacher encourages a lively, verbal exchange of ideas among the students as they attempt to solve the problem or answer the question.

2. Discussion engages the students in group problem-solving activities.

3. Discussion method may be used:

    a. With a homogeneous group (all students must be capable of contributing to and benefitting from the discussion)

    b. In the try-out stage of informational lessons.

C. Oral questioning method.

1. In this method the teacher poses a series of questions, either directed to specific students or to the class as a whole. One or more students answer each question orally and the teacher reacts to the answers as they are given.

2. Oral questioning engages the students in individual (oral) problem-solving activities.

3. Oral questioning method may be used:

    a. With a homogeneous group (all students are expected to be able to answer most of the questions posed by the teacher).

    b. In the try-out stage of informational lessons.

UNIT	SUMMARY OF LESSON 5 FILM PRESENTATION
4	TEACHING FOR UNDERSTANDING CON'T

D. Supervised study method.

1. In this method a written assignment sheet is given to each student which calls for him to read certain materials and then to answer written questions about the materials.

2. Each student may be given, and thus be working on, a different assignment.

3. The written assignment sheet contains:

   a. An introduction which psychologically prepares the student.

   b. Directions for finding specific written materials that should be studied by the student, e.g. textbooks, journals, information sheets.

   c. Questions covering the written materials studied by the student.

4. Supervised study method may be used:

   a. With a heterogeneous group - students with very wide differences in their backgrounds and/or abilities.

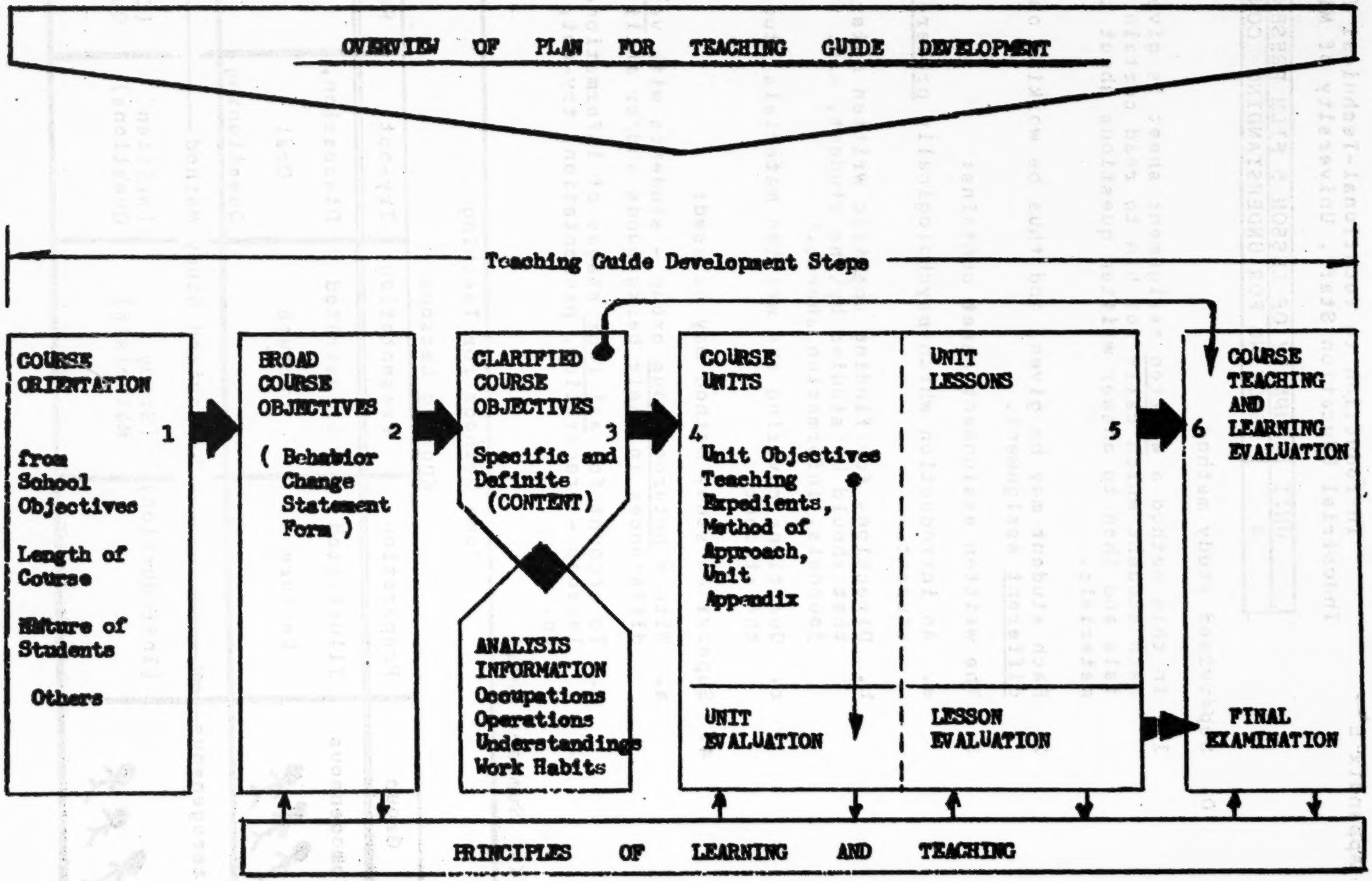
   b. To account for all four stages of informational lessons - preparation, presentation, try-out, follow-up.

III. Summary Chart

<table>
<tr><th colspan="5">Some Methods for Teaching
Knowing Lessons</th></tr>
<tr><th>Group</th><th>Preparation</th><th>Presentation</th><th>Try-out</th><th>Follow-up</th></tr>
<tr><td>Homogeneous
 </td><td>Illustrated Lecture</td><td>Illustrated Lecture</td><td>Discussion, Oral Questioning</td><td></td></tr>
<tr><td rowspan="2">Heterogeneous
 </td><td colspan="4">← Supervised Study Method →</td></tr>
<tr><td>(Introduction)</td><td>(Study Materials)</td><td>(Written Questions)</td><td>(Correcting Questions)</td></tr>
</table>

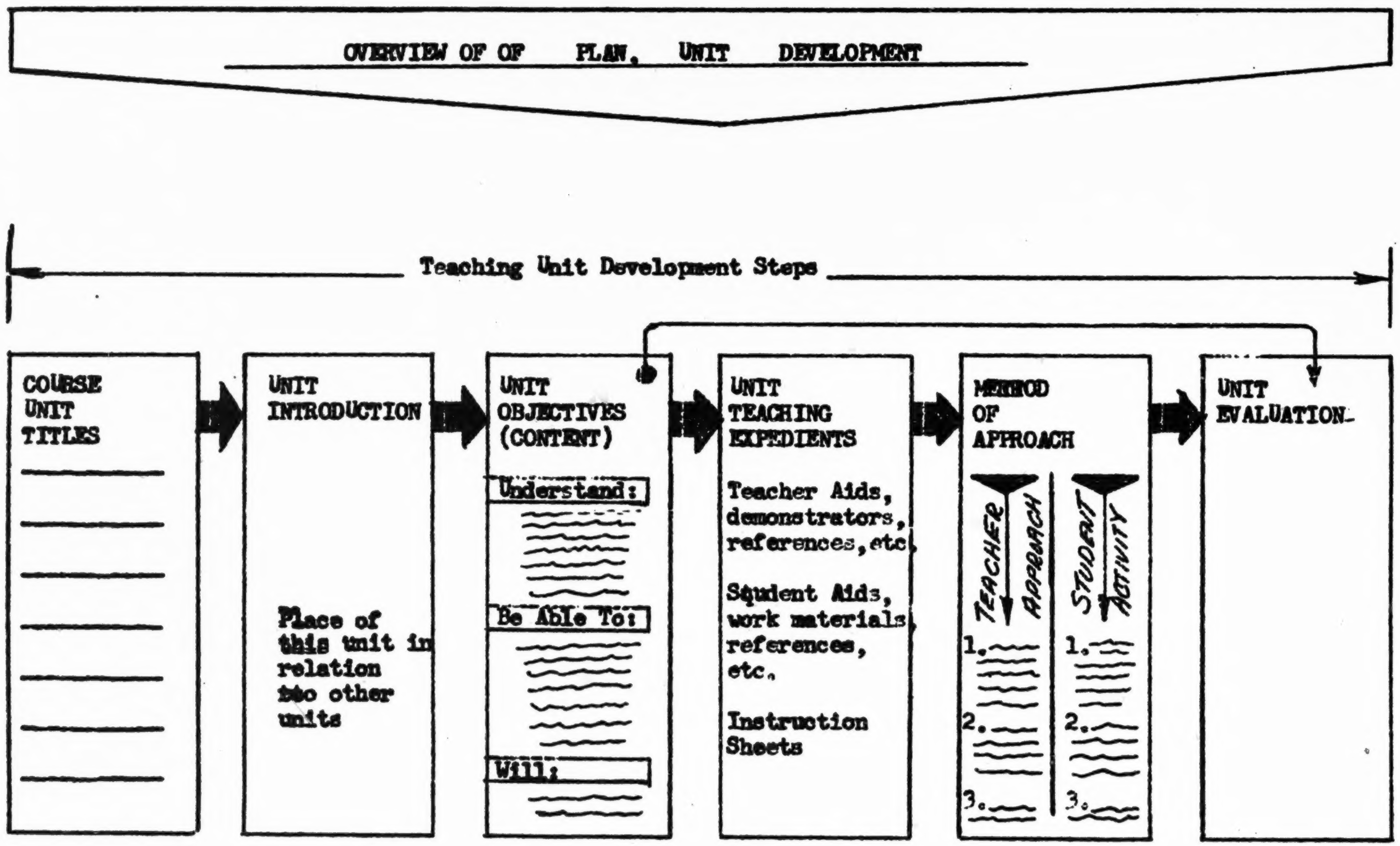
Appendix F

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota


OVERVIEW OF PLAN FOR TEACHING GUIDE DEVELOPMENT
Teaching Guide Development Steps
COURSE ORIENTATION
1
from School Objectives
Length of Course
Nature of Students
Others
BROAD COURSE OBJECTIVES
2
(Behavior Change Statement Form)
CLARIFIED COURSE OBJECTIVES
3
Specific and Definite (CONTENT)
ANALYSIS INFORMATION
Occupations
Operations
Understandings
Work Habits
COURSE UNITS
4
Unit Objectives
Teaching Expedients,
Method of Approach,
Unit Appendix
UNIT EVALUATION
UNIT LESSONS
5
LESSON EVALUATION
COURSE TEACHING AND LEARNING EVALUATION
6
FINAL EXAMINATION
PRINCIPLES OF LEARNING AND TEACHING

Appendix G

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota


OVERVIEW OF OF PLAN, UNIT DEVELOPMENT
Teaching Unit Development Steps
COURSE UNIT TITLES
UNIT INTRODUCTION
Place of this unit in relation to other units
UNIT OBJECTIVES (CONTENT)
Understand:
Be Able To:
Will:
UNIT TEACHING EXPEDIENTS
Teacher Aids, demonstrators, references, etc.
Student Aids, work materials, references, etc.
Instruction Sheets
METHOD OF APPROACH
TEACHER APPROACH
STUDENT ACTIVITY
1.
2.
3.
1.
2.
3.
UNIT EVALUATION

Unit 4

Planning the Lesson

TEACHER'S GUIDE

FOR

PLANNING THE LESSON | UNIT 4

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining filmed presentations and seminar discussions designed to provide twenty-four clock hours of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 4	INTRODUCTION

Unit 4, "Planning the Lesson," is an integral part of a series of twelve two-hour unit lessons designed to provide prospective teachers with an initial exposure to the job of the instructor in vocational-technical education. The lesson, therefore, should be utilized in its proper sequence in the series, and is intended only as an intruduction to the basic concepts and procedures involved in planning the lesson.

This teacher's guide is to be used in conjunction with a one-half hour filmed presentation covering the content of Unit lesson 4.

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT 4 | UNIT OBJECTIVES

A student achieving the broad objectives for this course as clarified for this unit should:

(1) Understand the first principles for organizing course elements of content into lessons.
(2) Understand purposes of and relationship among, the four stages of a lesson.
(3) Be able to organize the course elements of a course outline into lessons.
(4) Be able to explain how to provide for each stage in teaching the content of a lesson.

The specific objectives (content) for attainment in this unit are:

STUDENTS WILL UNDERSTAND: facts, principles, generalizations

1. Lesson Content Selection
    - A. Lesson
    - B. Lesson Sequencing
    - C. Doing Lessons
    - D. Knowing Lessons
    - E. Effect of Content Complexity
    - F. Effect of Student Ability

2. Lesson Objectives
    - A. Behavioral Expectations
    - B. Relation to Content
    - C. Unit and Course Objectives

3. Stages in the Lesson
    - A. Four Stages
    - B. Constancy of Stages

4. Preparation Stage
    - A. Content Reivew
    - B. Motivation
    - C. Relation to Old Content
    - D. Content Overview

5. Presentation Stage
    - A. Communicating Content
    - B. Estimated Duration

6. Try-out Stage
    - A. Applying Content
    - B. Practice Period
    - C. Memorization Period

7. Follow-up Stage
    - A. Evaluation of Learning
    - B. Formal Tests
    - C. Observation of Performance
    - D. Diagnostic

UNIT 4 | LESSON MATERIALS

A. The thirty-minute film, "Planning the Lesson," may be obtained from the Director, Vocational Section, State Department of Education, Centennial Building, St. Paul, Minnesota 55101.

B. One copy of each of the following materials is provided in the Appendix of this guide for use by the discussion leader.

1. Script of film, "Planning the Lesson"
2. Unit Lesson 4 Test*
3. Unit Lesson 4 Test Answer Sheet*
4. Unit Lesson 4 Test Answer Key
5. Sample Lesson Plan Format*
6. Summary of Lesson 5 Film Presentation*
7. Unit Lesson 4 Teacher References

c. Written examples of partial course outlines relevant to the students' technical areas of competence should be available. These may be supplied by the discussion leader or developed by students following lessons 2 and 3.

---

*This material will also be utilized by students during the conduct of the lesson. The required number of copies should be duplicated by the discussion leader.

UNIT 4 | SUGGESTED METHOD OF APPROACH*

DISCUSSION LEADER	STUDENT ACTIVITY
1. If it has not been previously distributed, hand out "Summary of Lesson 4 Film Presentation". Advise students that this provides a lesson overview, eliminates the need to take notes during film viewing, and can be used as review material.	1. Study "Summary of Lesson 4 Film Presentation
2. Arrange for student(s) to view film of Lesson 4, either individually or in a group.	2. View film of Lesson 4
	3. Review "Summary of Lesson 4 Film Presentation
4. Administer Lesson 4 test (Distribute test and answer sheets; no time limitation on the test.)	4. Complete test answer sheet
5. Provide (orally) correct responses to test questions.	5. Score answer sheet. Enter test score on their own progress chart by code number. Instructor will provide code numbers.

*The same approach can be used for one student or a group of students. While this approach is a suggested one, teacher's for whom this content is new should follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 4 | SUGGESTED METHOD OF APPROACH

Continued--

DISCUSSION LEADER	STUDENT ACTIVITY
6. Initiate discussion-rewiew, based upon incorrect test responses, to clarify lesson content.	6. Discuss reasons for correct and incorrect responses to test questions.
7. Collect scored answer sheets and tests.	
8. Demonstrate , and then supervise individual students, organizing course content into lessons.	8. Utilize written materials provided by the discussion leader, or samples of partial course outlines developed by themselves, in order to try out dividing course elements in the course outline into lessons.
9. Distribute "Sample Lesson Plan Format" and illustrate the kinds of content that might be included in each stage of a lesson.	
10. Initiate discussion to illustrate how the four stages of a lesson are used when teaching specific lesson content.	10. Explain verbally the content they might provide for each stage in the lesson using the total lesson content selected in step 8, above. (Students should retain the "Sample Lesson Plan Format" for use in Lesson 5.)
11. Arrange for individual remedial activities as needed.	
12. Introduce next lesson unit and hand-out "Summary of Film Presentation" for Unit Lesson 5.	

UNIT	UNIT RESOURCE APPENDIX
4	PLANNING THE LESSON

RESOURCE MATERIAL INCLUDED

A. Script of film, "Planning the Lesson"

B. Unit Lesson 4 Test (to be duplicated for student use)

C. Unit Lesson 4 Test Answer Sheet (to be duplicated for student use)

D. Unit Lesson 4 Test Answer Key

E. Sample Lesson Plan Format (to be duplicated for student use)

F. Summary of Lesson 5 Film Presentation (to be duplicated for student use)

G. Unit Lesson 4 Teacher References

Appendix A

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	UNIT EXAMINATION
4	PLANNING THE LESSON

Directions: Select the one best alternative from along the four alternatives presented in each item. Darken the circle on the separate answer sheet corresponding to the alternative you have selected.

1. A lesson contains:

   A. 1/3 to 1/8 of the course content
   B. Content for one class period
   C. Content that can be learned effectively at one time
   D. One essential element of content

2. The content for each lesson is selected:

   A. After sequencing essential elements of content
   B. Before sequencing essential elements of content
   C. Before making the instructional analysis
   D. After making the instructional analysis

3. Lessons should ordinarily contain:

   A. Only one knowing element
   B. Only one doing element
   C. One doing or one knowing element
   D. One doing and one knowing element

4. In the selection of knowing elements to include in a lesson:

   A. The more complex the content the fewer the number of elements included
   B. The more complex the content the greater the number of elements included
   C. The complexity of the content does not affect the number of elements included
   D. The complexity of the content has a variable affect on the number of elements included

5. Enough knowing elements should be included in each lesson to:

   A. Form a useful block of information
   B. Attain the objectives of the lesson
   C. Provide enough content for a written test
   D. Permit dividing the unit into three parts

UNIT	UNIT EXAMINATION
4	PLANNING THE LESSON CONT'D

6. In the selection of knowing elements to include in a lesson:

   A. The more able the students the fewer the number of elements
   B. The more able the students the greater the number of elements included
   C. The ability of the students does not affect the number of elements included
   D. The ability of the students has a variable affect on the number of elements included

7. What the teacher expects the students to be able to do or know after instruction is called:

   A. Lessons
   B. Units
   C. Objectives
   D. Learnings

8. Which of the following statements is correct?

   A. Lesson objectives add up to unit objectives
   B. Unit objectives add up to lesson objectives
   C. Course objectives add up to lesson objectives
   D. There is no relationship among lesson, unit and course objectives

9. Specific goals or objectives for each lesson should be stated in terms of:

   A. Stages of the lesson
   B. Content presented in prior lessons
   C. New content of the lesson
   D. General objectives

10. The stages of a lesson:

    A. Change when content changes
    B. Change when student ability changes
    C. Change when either content or student ability changes
    D. Never change

11. The stage of the lesson in which students practice physical (motor) skills is called:

    A. Preparation
    B. Presentation
    C. Try-out
    D. Follow-up

UNIT	UNIT EXAMINATION
4	PLANNING THE LESSON CONT'D

12. The stage of the lesson in which old content is reviewed is called:

    A. Preparation
    B. Presentation
    C. Try-out
    D. Follow-up

13. The stage of the lesson in which the details of the new content is communicated is called:

    A. Preparation
    B. Presentation
    C. Try-out
    D. Follow-up

14. The stage of the lesson in which students are told the value of the new content is called:

    A. Preparation
    B. Presentation
    C. Try-out
    D. Follow-up

15. The stage of the lesson in which students use the new content is called:

    A. Preparation
    B. Presentation
    C. Try-out
    D. Follow-up

16. The stage of the lesson in which new content is overviewed is called:

    A. Preparation
    B. Presentation
    C. Try-out
    D. Follow-up

17. The teacher might give a written test to students as part of the:

    A. Preparation stage
    B. Presentation stage
    C. Try-out stage
    D. Follow-up stage

18. The teacher might tell the students about the variety of jobs in which measuring accurately with a micrometer is a necessity as part of the:

    A. Preparation stage
    B. Presentation stage
    C. Try-out stage
    D. Follow-up stage

UNIT	UNIT EXAMINATION
4	PLANNING THE LESSON

19. The teacher might have the students memorize terms as part of the:

    A. Preparation stage
    B. Presentation stage
    C. Try-out stage
    D. Follow-up stage

20. The teacher might demonstrate how to read a micrometer as part of the:

    A. Preparation stage
    B. Presentation stage
    C. Try-out stage
    D. Follow-up stage

Appendix B

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER SHEET - UNIT EXAMINATION
4	PLANNING THE LESSON

Name________________________________ Code No.____________
Date________________________________ Score______________
Discussion Leader____

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

Before you begin the examination or while you are waiting for others to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

Appendix C

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER KEY - UNIT EXAMINATION
4	PLANNING THE LESSON

Name______________________________

Date______________________________

Discussion Leader________________________

ANSWERS	INSTRUCTOR NOTES
EXAMINATION ANSWERS (Darken the appropriate circle)	

	A	B	C	D
1.	○	○	●	○
2.	●	○	○	○
3.	○	●	○	○
4.	●	○	○	○
5.	●	○	○	○
6.	○	●	○	○
7.	○	○	●	○
8.	●	○	○	○
9.	○	○	●	○
10.	○	○	○	●
11.	○	○	●	○
12.	●	○	○	○
13.	○	●	○	○
14.	●	○	○	○
15.	○	○	●	○
16.	●	○	○	○
17.	○	○	○	●
18.	●	○	○	○
19.	○	○	●	○
20.	○	●	○	○

FILM SCRIPT	DR. JEROME MOSS, JR.
UNIT 4	PLANNING THE LESSON

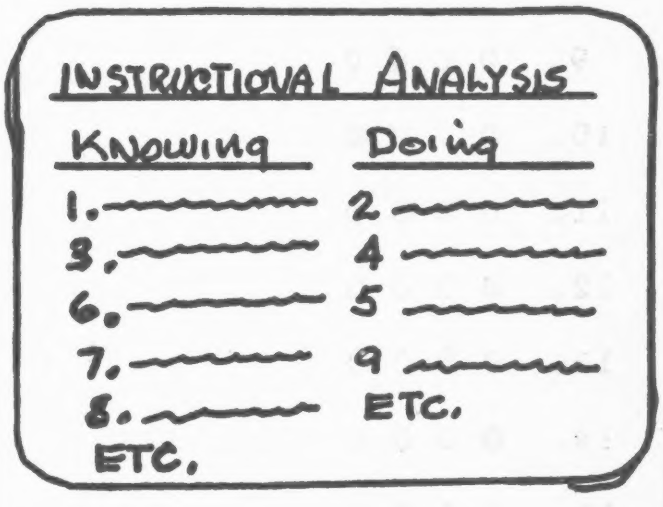
AUDIO	VIDEO

Good evening. Welcome to the 4th session in this series on Vocational and Technical Teaching. My name is Jerry Moss, and I will be conducting this, as well as next week's sessions.

The topic for tonight is entitled "Planning the Lesson." You'll be learning how the teacher subdivides the content of his course into manageable pieces for actual presentation to the class, and you'll also learn about some of the things the teacher must do in order to help the students learn the content most efficiently.

But before beginning to discuss this new material, I believe it would be a good idea to briefly review some of the more important points covered in the last two sessions. This will reinforce those ideas and also help you to logically relate the content of previous lessons to tonight's content.

You will recall that Dr. Kavanaugh said the first step in preparing to teach was to develop general or broad course objectives.



Then, with guidance from these objectives and your own trade competencies, an instructional analysis should be made to reveal the essential elements of content to be included in the course. The elements selected can be divided into knowing elements - that is, information, facts and principles which the teacher wants the students to understand - and doing elements - those motor or physical skills which the teacher wants the students to develop. Of course, the fifteen essential elements of content shown on this chart are just illustrative. An actual analysis might reveal several hundred content elements.

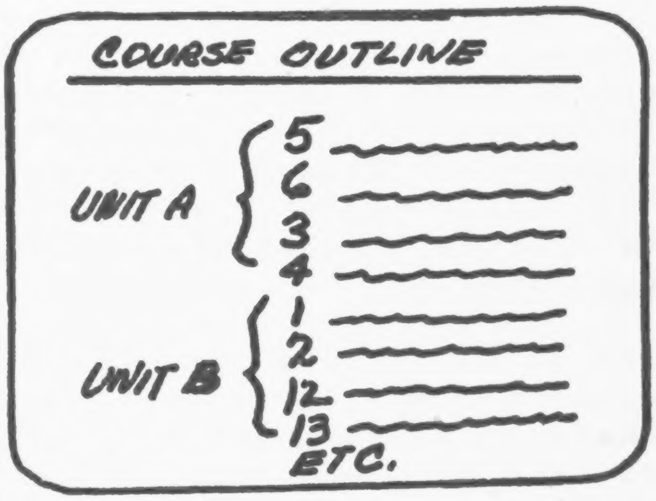
After identifying the content to be taught, a subsequent step in getting ready to teach is to organize the course elements in a way that make them easiest for students to learn.

AUDIO | **VIDEO**

To do this, the teacher must first arrange the content elements into Units. Each Unit forms a major subdivision of the course - a broad category of content containing both knowing and doing elements which are closely related to each other and to the topic of the Unit. Each course will usually have about 3-8 Units.

The teacher must also decide on the best order or sequence in which to teach the Units and the most effective way to arrange the essential elements of content within each Unit. He does this by applying the organizational principles suggested by Dr. Kavanaugh during the last session. With these organizing principles, the teacher sequences Units and interrelates the doing and knowing elements within Units in order to facilitate student learning.

What the teacher ends up with is a course outline. That is, course elements organized into Units, with each Unit containing appropriate, properly sequenced elements of content. This chart illustrates a course outline in which the essential elements have been organized into three Units, A, B, C, to be taught in that order. The teacher has decided that the doing and knowing elements 3, 4, 5, 6, belong in Unit A and that they should be taught in the order 5, 6, 3, 4.



And this brings us to the end of the review of the two previous sessions.

MOTIVATION AND OVERVIEW

Having come this far is a big start, but the teacher is still not ready to face his class. He knows what he is going to teach and the order in which he will teach it, but he still does not know how much he should try to teach students at any one time. Nor does he know what are the most effective ways of teaching the content. The job of the teacher in the

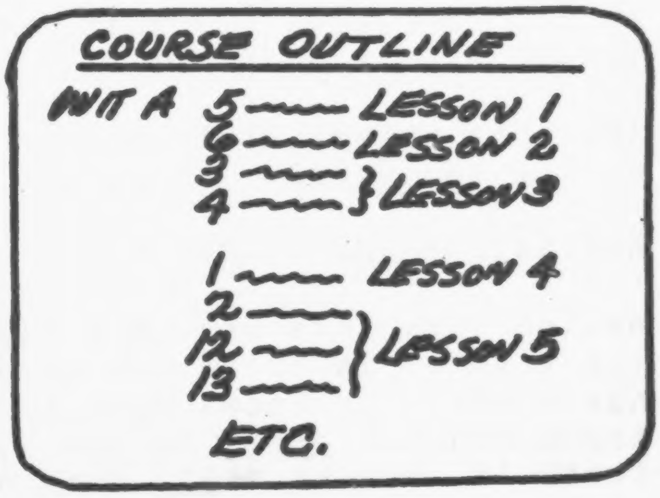
AUDIO | VIDEO

classroom is twofold. He selects and orders content to give direction to student learning, but he also must make that learning as efficient and effective as possible. For the rest of this session on Planning the Lesson, we'll begin to investigate how the instructor should go about teaching the content. First, I'll cover the topic of how to select content for one lesson. Then I'll introduce you to the four stages in each lesson that must be provided by the instructor if the students are to learn effectively.

SELECTING CONTENT FOR A LESSON

The Unit usually contains too much content for the teacher to present at one time to his students. On the other hand, each essential element of content may be too little. And so it is necessary for the teacher to select the amount of new content which he feels is proper to introduce to the students. This proper amount of content is called a lesson; it consists of one or more essential elements taken in sequence - in order - from the course outline. Each lesson contains the amount of new content which the teacher feels can be learned effectively by his students at one time.

Let me illustrate this step of selecting content for a lesson with this chart. The chart shows the same example of a course outline that you have previously seen, but now the teacher has decided which elements of content should be included in each lesson. His first lesson will contain element 5; his second lesson will contain element 6; his third lesson will contain course elements 3 and 4, and so on. In this example the teacher has decided to organize his 3-Unit course into a total of eight lessons.



AUDIO

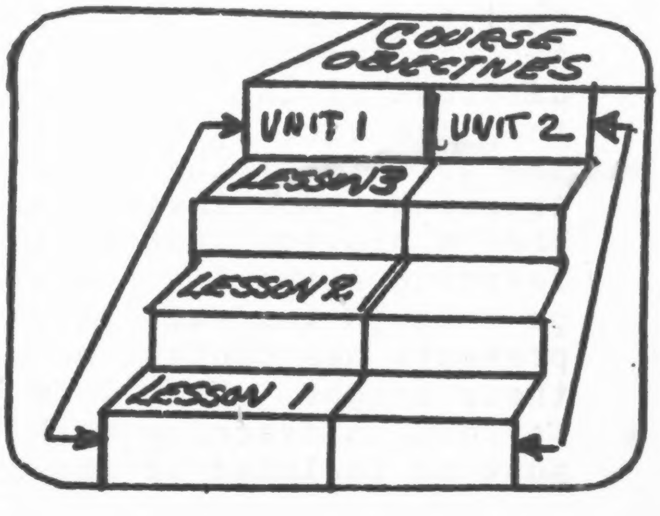
VIDEO

Note that since the Units and course elements within Units have already been placed in proper sequence, the order in which the lessons shall be taught has already been determined. Each lesson starts where the last lesson stopped. But how many elements of content should be included in each lesson - in other words, what is the proper amount of content to teach at one time?

There are several principles the teacher can use in making this decision. Here are a few of the more important ones. First, the "doing" course elements (for example element 5 or perhaps element 11) are single manipulative operations - like planing a board, soldering wires, or honing a razor. These "doing" operations should usually be taught by themselves. One "doing" element per lesson. Second, the amount of "knowing" elements included in a lesson depends upon several factors. The more complex the content, and/or the less able the students, the fewer knowing elements that can be profitably taught at one time. In any event, enough knowing elements should be included in the lesson so they form a meaningful segment of content that can be used and applied by the students. For example, on this chart lesson 3 contains elements 3 and 4, while lesson 6 contains four elements.

A good rule of thumb is to limit the new content in each lesson so that you can present it to students within thirty minutes.

It should help you to think of your course outline as a stairway leading to your broad course objectives. Each unit represents one flight of stairs, and each lesson a step in that flight. Each step or lesson leads to the next step or lesson, each step is dependent upon the prior step for support. The steps can't be too steep,



AUDIO	VIDEO

else the student will stumble, nor should it be too shallow, else the student will take too much time getting to the top of the stairway.

After deciding upon the content to include in each lesson, the teacher is ready to state his objectives for that lesson. As the result of learning the content chosen, what does the teacher expect each student to be able to do, or to know? The lesson objectives are short-range goals that must be stated in terms of the lesson content. If the teacher has these objectives or goals very clearly in mind it permits him to evaluate the students' progress - to decide how much they have learned - and also to judge how well he has taught. The lesson objectives add up to Unit objectives, and Unit objectives, in turn, add up to total course objectives.

FOUR STEPS IN A LESSON

Now that the teacher knows what to teach in the lesson, that is, he has chosen the content elements that he will present at one time to the students, and he has the objectives or goals for that lesson clearly stated, he is ready to think about how he will go about helping the students learn the lesson content.

There seems to be a natural order in the way people learn outside of the school situation. They go through certain stages in the process of learning something new. What makes these stages so important is that they appear to lead to the most efficient learning, they are the same regardless of the content being learned, and they are equally effective regardless of the ability of the individual doing the learning. For these reasons, the teacher should provide opportunities in the school learning situation for all his students to go through the same steps. Each time he presents new content he should provide for these stages. What I am saying in effect, is that in teaching each lesson, four stages must be included if the new content of that

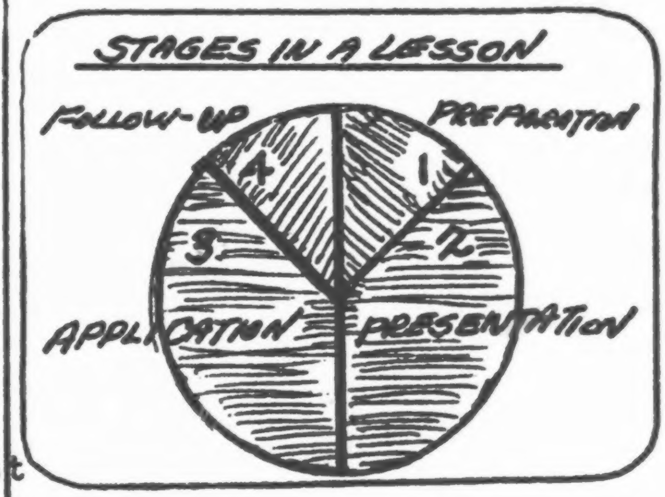
AUDIO | VIDEO

lesson is to be learned most efficiently and effectively.

What are these stages?

Each lesson should consist of the four stages shown on this chart.

Let me explain each stage very briefly and then come back to elaborate on them more fully.



Stage 1 is called preparation. It means preparing the student. In this stage the teacher helps the student get ready psychologically to receive the new content.

Stage 2 is called presentation. This is the part of the lesson in which the new content is actually presented to the students. Note that communication of the new content is just one stage of the lesson, and that it may not even be the longest part of the lesson.

Stage 3 is the try-out. In this stage the teacher provides an opportunity for the student to use the new content in an appropriate fashion. The student applies the content in some realistic situation.

Finally, stage 4, follow-up, is the evaluative stage of the lesson. Here the students get an opportunity to see how well they have learned, and the teacher has an opportunity to judge how well he has taught.

Let me reemphasize that in every lesson, every time the teacher decides to present certain new content, he plans to provide for all four stages.

Now let's take a more detailed look at each stage in the lesson.

AUDIO

The first stage is the preparation stage, and its purpose is to get the student psychologically ready to receive the new content.

First, the teacher wants the student's individual attention. He wants the student to think about the new content. But the student must be willing to think about the content of the lesson and not about something else. The student must have a reason for thinking and acting in accord with the teacher's requirements - for cooperating with the teacher. Thus, in this stage of the lesson, the teacher tries to point out, or make obvious, why it is worth the student's time and effort to learn the new content.

Second, in order for the new content to be most meaningful to the student, for him to understand it properly, the student must be able to relate the new content to material which he already knows. And so, as part of the preparation stage, the teacher should briefly review the content of the past lessons and point out the connections between those lessons and the new content.

Finally, as a part of the preparation stage, the teacher should provide a brief overview of the new content to be presented in that lesson. This helps the student organize the new material in his mind so that the details of the new content can be properly related to the major points made in the lesson.

In all, and just as a rule of thumb, about 2-10 minutes may be taken by the teacher to accomplish this preparation stage of the lesson.

In order to illustrate the preparation stage, watch this two-minute video tape showing Mr. Harold Hanson, a teacher at St. Paul Vocational-Technical School, psychologically preparing his class. Note how he overviews the new content, points out its value to the students, and relates it to prior lessons.

VIDEO

FILM CLIP
SHOWING
PREPARATION
STAGE
OF
A LESSON

AUDIO	VIDEO
Harold does a fine job of preparing his students.	
PRESENTATION STAGE Now, let's move to the second or presentation stage of the lesson. This is the portion of the lesson in which the students are brought into contact with the details of the new content. Here the teacher demonstrates a new "doing" operation, or he verbally or visually presents new information that he wants students to understand. Earlier, I mentioned thirty minutes as a rough maximum to use when you're in doubt about how much new content to include in one lesson. Watch this example which shows Mr. Hanson beginning to demonstrate a new "doing" operation to his class. The tape will last only two minutes, but it illustrates one way teachers use to present new content.	FILM CLIP SHOWING DEMONSTRATION AS ONE KIND OF PRESENTATION STAGE OF A LESSON
In the next two sessions of this series we'll discuss several ways of presentingnnew content to students. TRY-OUT STAGE The third stage of each lesson is the try-out. This stage calls for some overt student activity, such as talking, writing or performing some physical operation. It provides students with an opportunity to use the new content in some practical manner. Often, this can be the longest stage in the lesson, especially if the teacher wants the students to memorize terms or symbols or if he wants the students to practice some doing operation in order to develop a proper amount of speed and precision.	FILM CLIP SHOWING TEACHER'S SUPERVISION OF TRY-OUT STAGE OF A LESSON

AUDIO	VIDEO
The final video tape we have to show you depicts Mr. Hanson supervising students in their activities during the try-out stage of a lesson.	
Close supervision in the try-out stage of skill development is very necessary in order to prevent the development of bad habits.	
FOLLOW-UP STAGE	
The last stage in the lesson is the follow-up. The students need to know if they've learned properly and made some progress toward occupational competence. You, as the teacher, will benefit by knowing how well you have taught. You also have to judge whether the students have learned enough to permit them to move on to the next lesson. All these reasons require evaluation of student learning, and this is the purpose of the follow-up stage. Sometimes a formal test of some kind is administered to the students, other times the teacher evaluated learning informally by observing the students' performance during the try-out stage, just as you have already seen Mr. Hanson doing in the last video tape. Whether the teacher uses formal or informal techniques, he judges student progress toward the lesson objectives he has established, and then he decides whether he must re-present parts of the content of the lesson, in order to increase learning, or whether the students have learned enough for them to proceed to the next lesson in the course outline.	
This whole sugject of evaluation will be discussed by Dr. Randleman later in this series on vocational and technical teaching.	
I'm sure you recognize that since this lesson began I've been through the preparation stage, and have been and am now in the presentation stage. But perhaps you're asking yourself how I, in this lesson,	

intend to provide for the try-out and evaluation stages which have been pointed out as necessary to each lesson? Well, I can't very well handle those stages unless I can arrange to involve you in some activity. It is for this reason that we have arranged to follow each of the 12 presentations in this series with a group meeting of prospective instructors. The group meeting, under the supervision of a discussion leader, will provide an opportunity for discussing the content of each lesson, for applying the ideas presented to your own potential teaching situations, and for evaluating understanding of the lesson content.

SUMMARY AND REVIEW

In the few remaining minutes of this series let me summarize some of the major points covered.

First, the essential elements of content within each Unit in the course outline must be organized into one or more lessons. Second, each lesson should contain the number of course elements that can most effectively be taught to students at one time. Third, objectives must be formulated and stated for the lesson in terms of the content selected. Fourth, in teaching the new content the instructor must provide for four stages in the learning process. In the first stage, preparation, the teacher helps students become psychologically ready to learn the new content. In the second stage, presentation, the teacher brings the students in contact with the new content. In the third stage, try-out, the teacher has the students use the new content in a practical situation. And finally, in the fourth stage, follow-up, the teacher and the students evaluate the progress that has been made toward achieving the lesson objectives.

FILM SCRIPT	PLANNING THE LESSON
UNIT 4	PAGE 11

AUDIO	VIDEO
Next week's lesson is entitled "Teaching for Understanding." In that lesson I shall talk about several techniques used by the teacher in carrying out the preparation, presentation and try-out stages of lessons. Until next week then, goodnight, and thank you for your attention.	

UNIT	SUMMARY OF FILM PRESENTATION
5	TEACHING FOR UNDERSTANDING

I. Review of Lessons 2 and 3

A. Use broad course objectives and trade competencies as a guide to make an instructional analysis.

1. The instructional analysis contains elements of content to be included in the course.

2. The elements of content in the analysis are organized into "knowing" elements (information to be understood) and "doing" elements (motor or physical skills to be developed).

["Being" elements are not discussed in this or on subsequent lessons on this series.]

INSTRUCTIONAL ANALYSIS

Knowing	Doing
1. ____________	2. ____________
3. ____________	4. ____________
6. ____________	5. ____________
7. ____________	9. ____________
8. ____________	11. ____________
10. ____________	14. ____________
12. ____________	
13. ____________	
15. ____________	

UNIT	SUMMARY OF FILM (CONTINUED) TEACHING FOR UNDERSTANDING

B. Determine the order in which to teach content elements

1. Organize course elements into units

   a. Each unit is a major subdivision of the course; each course will usually have about 3-8 units.

   b. Each unit contains both knowing and doing elements from the instructional analysis that are related to each other and to the topic of the unit.

2. Sequence or order the units and the knowing and doing elements within each unit

   a. [Specific principles for sequencing elements presented in lesson ____ are not reviewed.]

C. The outcome of steps A and B is a course outline

COURSE OUTLINE

Unit A 5.__________
6.__________
3.__________
4.__________

Unit B 1.__________
2.__________
12.__________
13.__________

Unit C 7.__________
8.__________
9.__________
10.__________
11.__________
15.__________

II. Organize the content elements in the course outline into lessons

A. Each lesson contains one or more course elements taken in sequence from the course outline.

1. The course elements of each unit should be organized into one or more lessons
2. Each lesson starts where the last lesson stopped

COURSE OUTLINE

Unit A	5.__________	Lesson 1
	6.__________	Lesson 2
	3.__________	Lesson 3
	4.__________	
Unit B	1.__________	Lesson 4
	2.__________	
	12.__________	Lesson 5
	13.__________	
Unit C	7.__________	Lesson 6
	8.__________	
	9.__________	
	10.__________	
	11.__________	Lesson 7
	15.__________	Lesson 8

B. Each lesson contains the number of course elements that can be learned most effectively by students at one time.

1. Both doing and knowing elements should usually not be contained in the same lesson.
2. "Doing" lessons should normally contain only one doing element.
3. "Knowing" lessons may contain more than one knowing element.
    a. The greater the complexity of the informational content the fewer the knowing elements in the lesson.
    b. The less able the students the fewer the knowing elements in the lesson.
4. Normally, limit the content in doing and knowing lessons so it can be presented to students within 30 minutes.

UNIT	SUMMARY OF FILM (CONTINUED)
5	TEACHING FOR UNDERSTANDING

III. State the lesson objectives

A. Lesson objectives must be stated in terms of the lesson content -- specifically what the student should know or be able to do as the result of the lesson.

B. Lesson objectives "add up" to unit objectives, and unit objectives "add up" to course objectives.

IV. Stages in teaching the lesson

A. Every lesson must be taught so that it provides for the four stages in the learning process.

B. Stage 1 is preparation - it prepares the student psychologically.

1. The student must be shown why it is important for him to learn the new content of the lesson.

2. The student should be provided with an overview of the new content.

3. The relationships between the new content and previous lessons should be made clear.

C. Stage 2 is presentation - it brings the student into contact with the details of the new doing element or knowing elements of content contained in the lesson.

D. Stage 3 is try-out - it provides the student with an opportunity to use the new content in some manner.

1. Student talk or write about the knowing elements or perform a doing element.

2. This stage may take longer than any other stage in the lesson.

E. Stage 4 is the follow-up -- it permits both student and teacher to evaluate progress toward lesson objectives.

1. A formal test may be used to accomplish the purpose of this stage.

2. Informal evaluation by observation during the try-out stage may accomplish the purpose of stage 4.

UNIT	SAMPLE LESSON PLAN FORMAT
4	PLANNING THE LESSON

Title of Lesson: ______________________________ **Lesson No.:** _____

Unit, Phase or Block: ____________________ **Date Presented:** ________

Objectives: ____

____

____

____

____

Instructor: ________________________ **Total Time Allotted:** ________

I. PLANNING

(References, instructional aids, equipment, tools, cupplies)

II. PREPARATION

(Outline of material to cover for review, motivation, to show relationships and to provide an overview)

Approximate Time____
(Teaching Methods and Instructional Aids)

UNIT	SAMPLE LESSON PLAN FORMAT
4	PLANNING THE LESSON CON'T

III. PRESENTATION

Approximate Time:_______

(Teaching points in new content, operational analysis)	(Teaching methods and Instructional aids)
I. A.	

IV. APPLICATION

Approximate Time:_______

(Key questions, exercises, projects and assignments)	(Teaching methods and Instructional aids-materials, tools, equipment)

UNIT	SAMPLE LESSON PLAN FORMAT
4	PLANNING THE LESSON CON'T

V. EVALUATION

Approximate Time: ______

VI. ADVANCED PREPARATION

Approximate Time: ______

Teaching Time: Total Allotted__________: Actual Total__________

VII. LESSON CRITIQUE

(Appraisal of lesson and revisions to be made)

UNIT	TEACHER REFERENCES
4	PLANNING THE LESSON

References:

Bollinger, E. W. and Livingstone, H., Methods of Teaching Industrial Subjects, New York, N.Y., Industrial Teacher Training, 1946. (Mimeo.)

Kidd, D. M. and Leighbody, C. B., Methods of Teaching Shop and Related Subjects, Albany, N.Y., Delmar Publishers, Inc., 1955.

U. S. Department of Health, Education, and Welfare. Office of Education, The Preparation of Occupational Instructors: A Suggested Course Guide. OE-80042. Washington, D.C., U.S. Government Printing Office, 1966.

Unit 5

Teaching for Understanding

TEACHER'S GUIDE

FOR

TEACHING FOR UNDERSTANDING | UNIT 5

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining
filmed presentations and seminar discussions
designed to provide twenty-four clock hours
of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 5 INTRODUCTION

Unit 5 is the fifth lesson in the series of twelve two hour unit lessons designed to provide prospective teachers with an initial exposure to the role of the instructor in vocational-technical education. The topic of this lesson is "Teaching for Understanding". The content deals briefly with four of the major teaching techniques used by vocational-technical instructors to present informational content to groups of students.

This guide is to be used by the teacher-trainer in conjunction with a one-half hour filmed presentation covering the content of unit lesson 5.

UNIT 5	UNIT OBJECTIVES

A student achieving the broad objectives for this unit should understand the teaching techniques of illustrated lecture, discussion, oral questioning, and supervised study. In particular, the student will know, for each technique:

(1) The teacher and student activities involved.
(2) The nature of the student groups for which it is suitable.
(3) The stage(s) of the lesson for which it is appropriate.

The specific objectives (content) for attainment in this unit are:

STUDENT WILL UNDERSTAND: facts, principles, generalizations

1. Illustrated Lecture
   A. Telling supplemented by showing
   B. Students primarily listeners
   C. For homogeneous groups
   D. Used in preparation and presentation
   E. Visuals clarify, repeat, reinterpret
   F. Charts, chalkboard, video tape
2. Discussion
   A. For applying information
   B. Group problem solving
   C. Active involvement
   D. For Homogeneous groups
   E. Try-out stage
3. Oral Questioning
   A. For applying information
   B. Individual problem solving
   C. Active involvement
   D. Try-out stage
4. Supervised Study
   A. Individualized written problem solving
   B. For Heterogeneous groups
   C. Written instructional materials
   D. Assignment sheets (motivate, overview, assign, question)
   E. For all four stages in lesson

UNIT 5	LESSON MATERIALS

A. The thirty-minute film, "Teaching for Understanding", may be obtained from the Director, Vocational Section, State Department of Education, Centennial Building, St. Paul, Minnesota 55101.

B. One copy of each of the following materials is provided in the Appendix of this guide for use by the discussion leader.
   1. Script of the film, "Teaching for Understanding"
   2. Unit Lesson 5 Test *
   3. Unit Lesson 5 Test Answer Sheet *
   4. Unit Lesson 5 Test Answer Key
   5. Summary of Lesson 6 Film Presentation *
   6. Unit Lesson 5 Teacher References

C. Sample Lesson Plan Formats partially completed by students during the discussion phase of lesson 4 should also continue to be used during the discussion phase of lesson 5.

* Since this material will be used by the students during the conduct of the lesson, the required number of copies should be duplicated.

UNIT 5 SUGGESTED METHOD OF APPROACH

DISCUSSION LEADER	STUDENT ACTIVITY
1. If it has not already been distributed, hand-out "Summary of Lesson 5 Film Presentation". Advise students that the summary eliminates the need to take notes during the film viewing, and can be used as review material.	1. Study "Summary of Lesson 5 Film Presentation".
2. Arrange for student(s) to view film of lesson 5, either individually or in a group	2. View film of lesson 5
3. Administer lesson 5 test (distribute test and answer sheets; no time limitation on the test.)	3. Review "Summary of Lesson 5 Film Presentation".
4. Provide (orally) correct responses to test questions.	4. Complete test answer sheet
5. Initiate discussion-review, based upon incorrect test responses, to clarify lesson	5. Score answer sheet. Enter score on their own progress chart by code number.
6. Collect scored answer sheets and tests.	6. Discuss reasons for correct and incorrect responses to test questions
7. Initiate discussion concerning the appropriateness of various teaching techniques	7. Using lesson content and sample lesson plan formats from lesson 4, indicate (a) the relevant method for teaching the content specified for each stage of this lessons, (b) explain why they assume their classes will be homogeneous or heterogeneous, and how to judge this.
8. Demonstrate each technique and present in more detailed information about how each technique is used and (b) the audio-visual aids available	8. Participate in demonstrations and ask questions
9. Arrange for individual remedial activities as needed	
10. Introduct next lesson unit and hand-out "Summary of Film Presentation" for unit lesson 6	

UNIT 5 — UNIT RESOURCE APPENDIX TEACHING FOR UNDERSTANDING

RESOURCE MATERIAL INCLUDED

A. Script of film, "Teaching for Understanding"

B. Unit Lesson 5 Test (to be duplicated for student use)

C. Unit Lesson 5 Test Answer Sheet (to be duplicated for student use)

D. Unit Lesson 5 Test Answer Key

E. Summary of Lesson 6 Film Presentation (to be duplicated for student use)

F. Unit Lesson 5 Teacher References

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	UNIT EXAMINATION
5	TEACHING FOR UNDERSTANDING

Directions: Select the one best alternative from among the four alternatives presented in each item. Darken the circle on the separate answer sheet corresponding to the alternative you have selected.

1. In terms of their abilities to profit from the same lesson given at the same time, students in a homogeneous group are

   A. Equal
   B. Reasonably similar
   C. Very different
   D. All of the above

2. In terms of their abilities to profit from the same lesson given at the same time, students in a heterogeneous group are

   A. Equal
   B. Reasonably similar
   C. Very different
   D. All of the above

3. The teacher gives a written test covering the content of a lesson which he has taught using an illustrated lecture and a discussion. He would normally expect the students to earn the following test scores

   A. All score 100% correct
   B. All score 70% correct
   C. Scores range from 0% to 100%
   D. Score range from 70% to 100%

4. Visual aids serve to

   A. Clarify ideas
   B. Repeat ideas
   C. Reinterpret ideas
   D. All of the above

5. Which of the following is not a visual aid?

   A. Chart
   B. Drawing on a chalkboard
   C. Phonograph record
   D. Film strip

6. The method best suited to a heterogeneous group is called

   A. Illustrated lecture
   B. Discussion
   C. Oral questioning
   D. Supervised study

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	UNIT EXAMINATION
5	TEACHING FOR UNDERSTANDING

7. A method in which the teacher tells the students about the new content and supplements his verbal presentation with visual aids is called

   A. Illustrated lecture
   B. Discussion
   C. Oral questioning
   D. Supervised study

8. One method that can be used for carrying students throught all four stages of the lesson is called

   A. Illustrated lecture
   B. Discussion
   C. Oral questioning
   D. Supervised study

9. A method in which the students are primarily listeners is called

   A. Illustrated lecture
   B. Discussion
   C. Oral questioning
   D. Supervised study

10. The discussion method is used best during what stage of the lesson?

    A. Preparation
    B. Presentation
    C. Tryout
    D. Follow-up

11. A method that provides for individual oral problem-solving activity is called

    A. Illustrated lecture
    B. Discussion
    C. Oral questioning
    D. Supervised study

12. A method that provides for group problem-solving activity is called

    A. Illustrated lecture
    B. Discussion
    C. Oral questioning
    D. Supervised study

13. A method that provides for individual written problem-solving activity is called

    A. Illustrated lecture
    B. Discussion
    C. Oral questioning

    D. Supervised study

Appendix A

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	UNIT EXAMINATION
5	TEACHING FOR UNDERSTANDING

14. When the teacher asks, "What are lesson objectives? John, what is your answer?", the method the teacher is using is called

    A. Illustrated lecture
    B. Discussion
    C. Oral questioning
    D. Supervised study

15. The method used by the teacher to present the new content of lesson 5 in this series of lessons is called

    A. Illustrated lecture
    B. Discussion
    C. Oral questioning
    D. Supervised study

16. Written study or instructional materials are used as part of

    A. Illustrated lecture
    B. Discussion
    C. Oral questioning
    D. Supervised study

17. Written assignment sheets are used as part of

    A. Illustrated lecture
    B. Discussion
    C. Oral questioning
    D. Supervised study

18. Written assignment hseets do not

    A. Prepare students
    B. Present the details of new content
    C. Provide for try-out activities
    D. Permit an opportunity for evaluation of learning

19. The illustrated lecture is best used in the following situation

    A. Heterogeneous group, try-out stage
    B. Heterogeneous group, presentation stage
    C. Homogeneous group, try-out stage
    D. Homogeneous group, presentation stage

20. The discussion method is best used in the following situation

    A. Heterogeneous group, try-out stage
    B. Heterogeneous group, presentation stage
    C. Homogeneous group, try-out stage
    D. Homogeneous group, presentation stage

Appendix B

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER SHEET-UNIT EXAMINATION
5	TEACHING FOR UNDERSTANDING

Name
Code No.
Date
Score
Discussion Leader

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

Before you being the examination or while you are waiting for other to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

Appendix C

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER KEY - UNIT EXAMINATION
5	TEACHING FOR UNDERSTANDING

Name ____________________
Date ____________________
Discussion Leader ____________________

ANSWERS	INSTRUCTOR NOTES

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	●	○	○
2.	○	○	●	○
3.	○	○	○	●
4.	○	○	○	●
5.	○	○	●	○
6.	○	○	○	●
7.	●	○	○	○
8.	○	○	○	●
9.	●	○	○	○
10.	○	○	●	○
11.	○	○	●	○
12.	○	●	○	○
13.	○	○	○	●
14.	○	○	●	○
15.	●	○	○	○
16.	○	○	○	●
17.	○	○	○	●
18.	○	●	○	○
19.	○	○	○	●
20.	○	○	●	○

Appendix D

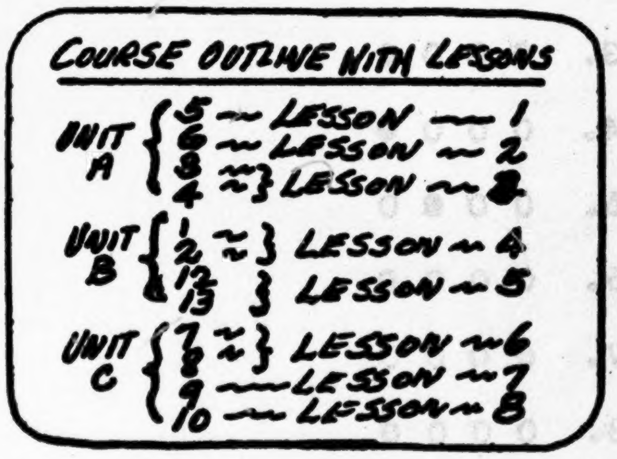
Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

FILM SCRIPT	DR. JEROME MOSS, JR.
UNIT 5	TEACHING FOR UNDERSTANDING

AUDIO	VIDEO

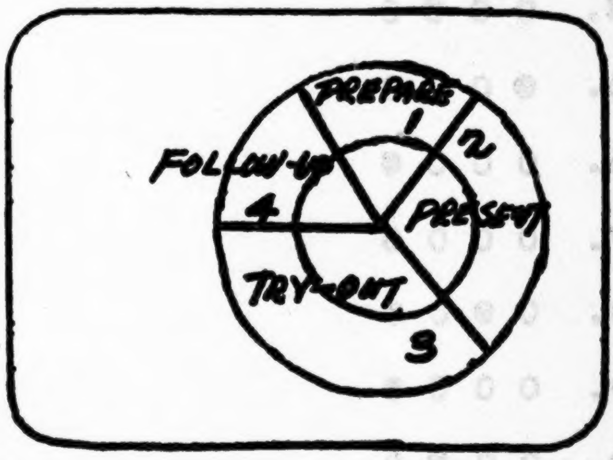
Good evening. I'm Jerry Moss and this is the fifth lesson in the series of twelve lessons on "Vocational-Technical Teaching."

The subject for today is "Teaching for Understanding." You'll learn about a few of the techniques or methods used by teachers in the classroom to help students understand new informational-knowing-content that is introduced during the course of one lesson.



Let's begin by building on our last session. Assume that the teacher has organized the essential elements of course content into units, and within each unit he has organized the content elements into doing lessons and knowing lessons. You will recall that informational or knowing content and doing or motor skill content were usually organized into separate lessons.

Let's also assume that the teacher has ordered the units, and the lessons within units, into the most effective sequence for teaching, and that he has already taught the first four lessons. The next lesson to be taught is Lesson 5. Let's say that Lesson 5 contains informational content. The major objectives of Lesson 5 would be to help students understand, remember, and apply the information in course elements 12 and 13.



Still borrowing from our last session, the teacher recognizes that to best accomplish his objectives he will have to provide for four stages in the lesson. He will first have to prepare the students psychologically, then he will present the new facts and principles that comprise informational the content. Following this he must provide an opportunity for the students to try-out or use the content in a realistic situation, and then he must evaluate or follow-up students' progress.

But how-with what techniques or methods-will the teacher prepare students, present

AUDIO	VIDEO
the new information, and then let them use the information? In other words, what will he do in front of his class, and what will he have his class od, during each of these stages in the lesson?	
I'm going to help you learn about four methods that you can use in one or more stages of an informational lesson. Of corse, you'll just hear about them, and briefly see them in operation, as a part of my presentation, but you will have and opportunity to try them out later in your group meetings. In the next session, Mr. Pucel will tell you about methods to use in teaching lessons with "doing" content.	
The four methods I will cover are called the illustrated lecture, the discussion, oral questioning and supervised study.	1- ILLUSTRATED LECTURE 2- DISCUSSION 3- ORAL QUESTIONING 4- SUPERVISED STUDY
Let's start with the illustrated lecture.	
The illustrated lecture is a method in which the teacher tells the students what he wants them to learn, and he supplements his verbal explanations by some kind of visual aid. In the illustrated lecture the students are primarily listeners, but they also learn by seeing, or looking at the visual materials provided by the teacher.	
Now, the easiest way for you to visualize and illustrated lecture is to watch someone conduct one. Here then is a short video tape showing Mr. Harold Hanson of St. Paul Vocational-Technical School giving part of an illustrated lecture to his electronics class. Note how Mr. Hanson uses the chalkboard to present ideas that would be almost impossible to describe using words alone.	FILM CLIP OF ILLUSTRATED LECTURE
It should be obvious to you by now that I have been using an illustrated lecture to present this lesson. My visual aids have consisted of charts and a video tape rather than a chalkboard. Mr. Hanson and I have	

AUDIO | **VIDEO**

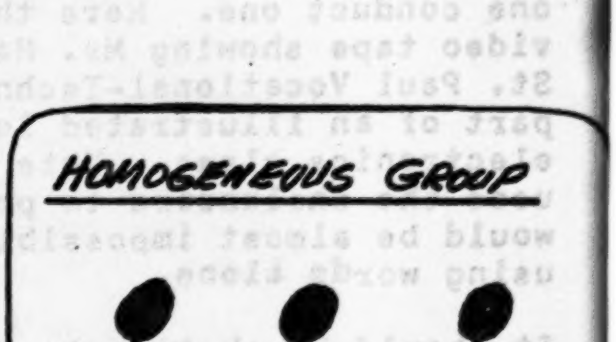
used visual materials to help explain ideas, or to directly repeat ideas we've presented verbally, or to reinterpret our spoken words, that is, to present the same information in a new way. The use of visual materials to supplement the spoken word makes it possible to communicate ideas faster and increases the probability of the students understanding the facts and principles presented.

There are a great many kinds of visual aids that the teacher can use to supplement his verbal presentation. In a later session in this series Dr. Pearson will tell you about and show you some of them and how to use them.

Now that you know what is meant by an illustrated lecture, let me point out when it should be used during the lesson.

First, the teacher who uses an illustrated lecture is assuming that each of the students in the group has the necessary background and ability to understand the content of the lecture. After all, in an illustrated lecture the teacher is presenting the same content, at the same rate, in the same way, to all of his students. The teacher does not have to assume that all of his students are exactly equal in their readiness to understand the content, or that they will all learn it equally well or at exactly the same rate. This is never true. But he is assuming, in using the illustrated lecture, that all of his students will learn enough from the lecture to make it well worth his time and the student's time.

Technically speaking, every time the teacher uses an illustrated lecture he is assuming that his students represent, for all practical purposes, a homogeneous group. That is, the students are sufficiently alike in their backgrounds and abilities to profit from the same presentation.

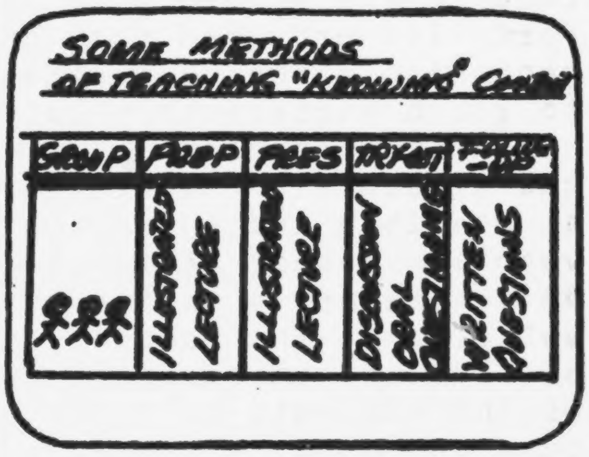


Appendix D

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

FILM SCRIPT	TEACHING FOR UNDERSTANDING
UNIT 5	PAGE 4

AUDIO	VIDEO



Now, in what stage of the lesson can an illustrated lecture be used assuming the content to be taught is informational - knowing elements - and assuming the teacher considers the students in his class a homogeneous group?

Since the preparation stage involves reviewing old content, overviewing new content, and pointing out the practical value of the new content, talking to the students, telling them about the value of the new content for example, may be a very practical way of carrying out the preparation stage. An illustrated lecture may therefore be a good technique or method for the teacher to use during the preparation stage of the lesson.

PULL COVER ON PREPARATION

In the same way, telling students about the new facts and principles you wish them to learn, and supplementing your verbal presentation with visual aids - like the chalkboard and charts - is also an efficient method to communicate the new content. And so the illustrated lecture is also useful during the presentation stage of the lesson. (Since I'm now using it for that purpose I sincerely hope it is a good method - at least I'm practicing what I'm preaching.)

PULL COVER ON PRESENTATION

The try-out stage of the lesson, on the other hand, calls for the active participation of students applying or using what they have learned in practical situations. Since the illustrated lecture is a one-way method of communication, in which the student merely hears and sees, it does not provide an opportunity for students to use the new content.

PULL COVER ON TRY-OUT

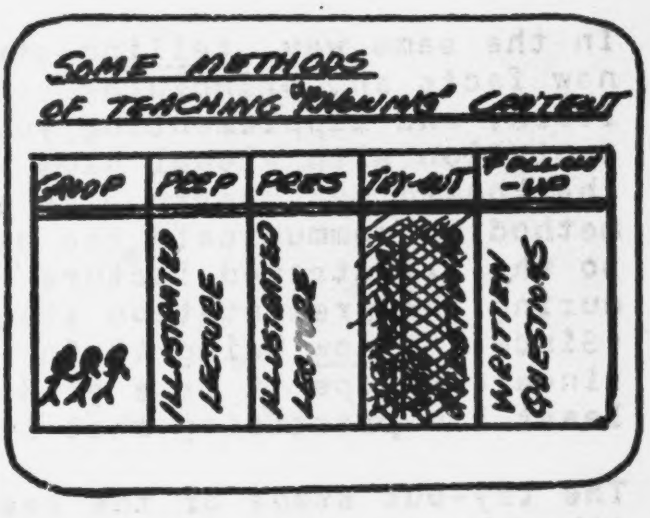
The second method of teaching, the discussion, is an appropriate method to use during the try-out stage of informational lessons. In a discussion, the teacher poses certain practical problems or questions to the class as a whole. These problems should

AUDIO | VIDEO

require the students to use the new information provided them during the presentation stage of the lesson in order to reach satisfactory solutions. After posing the problem, the teacher encourages the students to suggest as many solutions as possible and to engage in a lively, verbal exchange of ideas among themselves on the relative merits of the suggested solutions. The teacher, after posing the problem and encouraging the participation of the students in order to get the discussion going, thereafter trys to stay out of general conversation. The basic idea of the discussion is to get as many of the students actively involved in talking to each other about the problem, as possible. The discussion is a group problem-solving activity. It is by encouraging the active participation of the students that the primary purpose of the try-out stage of the lesson is satisfied.

A good discussion is therefore an appropriate method for the try-out stage of an informational lesson. Of course, if the teacher is to get all of his students to participate, they must all know something about the content of the problem he posed; to this extent the discussion requires a homogeneous group.

But perhaps a more common method used by teachers in the try-out stage of informational lessons is oral questioning. Like the discussion, the teacher poses a problem or question which calls for the students to use the information provided them during the presentation stage of the lesson. In the oral questioning method, however, the teacher does not encourage an interchange of ideas among students, instead he obtains answers to questions from individual students and he reacts to those answers. For example, the teacher can pose a question or problem, then he can call on a particular student for the answer, then he can react to the student's answer by indicating whether its a good or bad solution. Another way of engaging in oral questioning is for



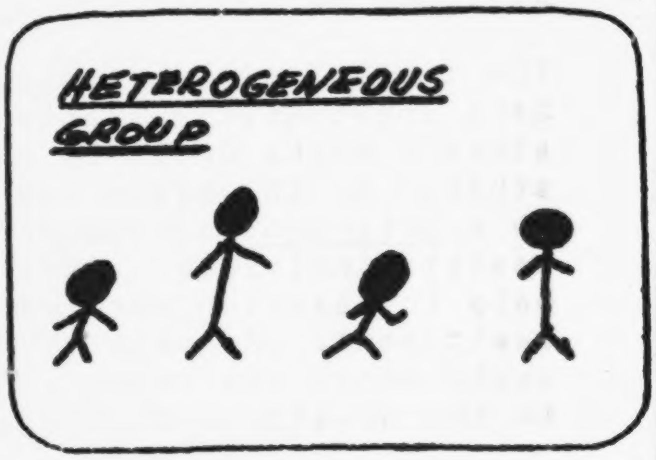
the teacher to pose a question or problem to the class as a whole and ask for volunteers to answer the question. The teacher then reacts to the answers given by each student. Thus, through a series of questions, the teacher engages the students in problem-solving activities on an individualized basis, rather than on a group basis as in the discussion.

VIDEO TAPE
ORAL
QUESTIONING

Here is a short video tape showing Harold Hanson conducting part of an oral questioning session following his illustrated lecture. Note that in this example, Harold poses a practical problem that obviously has several satisfactory solutions. He requests students to volunteer answers rather than calling on specific students, and he briefly evaluates each solution as it is given.

That was only part of the oral questioning session. Harold went on to pose additional questions. For some he asked for volunteers and for others he called on specific students. I might also add that Harold could have chosen to use a discussion in this situation.

Often, the teacher has a group of students that he cannot consider to be homogeneous or similar. For example, students might be assigned to his class at irregular intervals, some students may have been absent for several weeks, or beginners and advanced students may be combined in one class. Regardless of the reason, the teacher may find himself with a class in which very wide differences exist in the backgrounds and/or abilities of the students.



In this case the teacher has a heterogeneous group. He cannot consider them alike and therefore he cannot present the same content to all students at the same time, as in an illustrated lecture, because some students will not be able to understand anything about it and other students will know all of it already. When individual differences within the class are this

AUDIO

large, the teacher must use a different method than the illustrated lecture or discussion. One of the methods he can use is called supervised study.

Supervised study is a method in which written assignments are given to students in the class calling for them to read certain materials and then to answer certain written questions about the materials. Because of the differences among students in a heterogeneous group each student may receive a different written assignment requiring him to study and then answer questions about material which is most appropriate for him to learn at that time.

To conduct a class using the supervised study method the teacher must have written assignment sheets prepared in advance for each informational lesson in his course. The written assignment sheet for each lesson first overviews the lesson content, and explains its value to students. Then it gives the student a specific reading assignment. For example, it might say read Chapter 1 in the textbook entitled General Printing, or read information Sheet #3 called "The Use of Initial Letters", which has been prepared by the teacher especially for this lesson. Of course, to make the supervised study technique work, the teacher has to have the right kind of reading material available for every informational lesson in his course. Finally, the assignment sheet will contain questions covering the reading assignment which the student must answer after he has read the assigned materials.

The teacher gives each student the assignment sheet most suitable for him and the student works on it by himself. Each student in the class may thus be working on a different assignment. The teacher assists individual students as they need help in carrying out their particular assignment. As each student finishes his assignment, the teacher checks his answers to the questions on the assignment sheet,

VIDEO

ASSIGNMENT SHEET No. 1

I INTRODUCTION
(OVERVIEWS CONTENT)
(TELLS VALUE OF CONTENT)

II READING ASSIGNMENT
(READ CHAP. I, ETC.

III QUESTIONS
TO BE ANSWERED

FILM SCRIPT	TEACHING FOR UNDERSTANDING
UNIT 5	PAGE 8

AUDIO	VIDEO

and, if the student has done a good job, the teacher gives him the assignment sheet for the next informational lesson. Tests covering units can be developed by the teacher and administered to individual students when they are ready for them.

To give you a visual image of how the teacher uses the supervised study method, watch Mr. Hanson conducting his class using this method.

FILM CLIP
SUPERVISED
STUDY

Now that you know what the supervised study method is, let's spend a minute or two relating this method to the four stages in the lesson. In what stage or stages should the supervised study methods be used with heterogeneous groups for informational lessons?

The supervised study method encompasses - takes into account - all of the stages in a lesson. The preparation stage is carried out by the introduction on the assignment sheet which overviews the content and tells the students about its usefulness to them. The presentation stage is carried out when the students read the study materials - books, magazines, information sheets - stipulated by the reading assignment on the assignment sheet. The try-out stage is provided by requiring students to answer the questions given on the assignment sheet. Finally, the follow-up is conducted when the teacher corrects and discusses the students answers to the questions.

In the remaining minutes of this session, let me summarize some of the important ideas presented.

First, before teaching a lesson with knowing or informational content, the teacher must evaluate the content of his lesson on terms of the background and abilities of his class. If he can assume that the students in his class are sufficiently alike so that all will benefit from the same content, then he has a homogeneous group. If individual differences among students at that time are too great, then he has a heterogeneous group

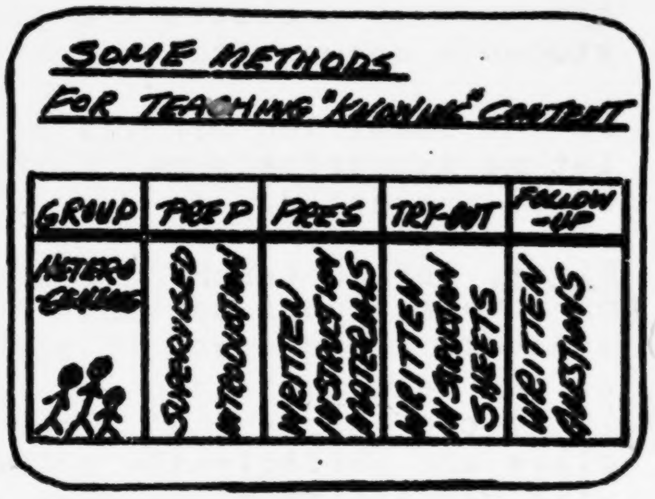
AUDIO **VIDEO**

and he must plan to provide different content for each student.

Second, assuming his class can be considered homogeneous, the teacher may use the illustrated lecture method for the preparation and presentation stages of the lesson. The teacher will plan to talk to his students - to tell them about the value of the new content and its relation to prior content and also to tell them the information (facts, principles, theory etc.) contained in the content of the new lesson. He plans to supplement his verbal presentation with visual aids that will help clarify, reinforce and reinterpret the new material.

Third, again assuming a homogeneous class, the teacher may plan to hold a discussion or oral questioning in the try-out stage of the lesson. He plans practical problems or questions which will cause the students to apply their newly acquired information. Then, he encourages the involvement of the class in an attempt to reach satisfactory solutions to the problems he poses either by having students engage in a lively, verbal interchange of ideas among themselves in a group problem solving situation, or by having them respond directly to the teacher in an individual problem solving situation.

Fourth, in the event that the teacher has a heterogeneous class, he can use the supervised study method. In this method the teacher utilizes written instructional materials - assignment sheet, study materials and perhaps unit tests. The teacher writes one assignment sheet for each informational lesson in the course. Each student is given the assignment sheet to work on which is most appropriate for his background at the time. The assignment sheet prepares the student psychologically in an introduction; it specifies certain study materials containing the new information to be read by the student, and it also presents questions that must be answered in writing by the student after reading the study materials. Thus, the



AUDIO	VIDEO
supervised study method provides for all stages in the lesson. The four methods presented in this lesson - illustrated lecture, discussion, oral questioning and supervised study - are not the only methods available to vocational and technical teachers, but they are among the basic techniques for teaching informational lessons. Its been very pleasant working with you these last two sessions. I hope its been profitable for you. Good luck to all of you in your future teaching assignments.	

UNIT	SUMMARY OF FILM PRESENTATION
6	TEACHING FOR MOTOR SKILL DEVELOPMENT

This summary of Unit 6 is planned for student use before viewing the film presentation. It is suggested that it be given to students at the close of Unit 5 as shown in the "Method of Approach" for Unit 5. In addition to a preview, the outline can also serve as review notes for this unit. The information outlined in blocks below is a duplicate of the visual materials shown during the video presentation.

I. Introduction

   A. Motor skill - doing element - operation
   B. Demonstration - teaching technique used in teaching a motor skill

II. Factors to Consider in Sequencing the Teaching of Operations

   A. Frequency of use in the occupation
   B. Logical order of skill development
   C. Maturity and dexterity of students

III. Student Motivation

   A. Definitions

      1. Intrinsic Motivation - motivation from within the student himself
      2. Extrinsic Motivation - motivation from a source other than the individual such as the job.

   B. Motivation and Teaching Technique

      1. Excercise method can be used when students have a high degree of intrinsic motivation.
      2. Job method should be used when internal motivation is lacking and can be used as well when students have intrinsic motivation.

IV. Job Sheet

   A. Definition

      1. A job sheet is a step by step list of procedures that outlines the procedure the instructor wants the students to follow in completing an exercise or job.

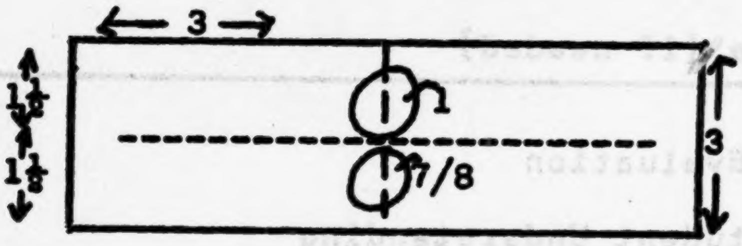
UNIT	SUMMARY OF FILM PRESENTATION (CONT'D)
6	TEACHING FOR MOTOR SKILL DEVELOPMENT

2. Does not indicate "how to perform an operation".

B. Instructor Checkpoints - predetermined job evaluation points

Job Sheet
Page 2
(Drilling Jig Job Sheet)
Part II

5. Lay out the centers as follows:



6. Bore 1" hole using a brace and auger bit.
7. Bore 7/8" hole using a brace and auger bit.
8. Sand Part II with #120 sandpaper.

V. Planning Related Information

A. Terminology
B. Processes Involved
C. Safety
D. Applications of Operation

VI. Planning the Demonstration

A. Operation Sheet - a step by step list of procedures one should follow in performing an operation.

1. Tools needed
2. Materials needed
3. Procedures
4. Information points
    a. notes - information essential for student understanding of the demonstration
    b. cautions - safety factors

UNIT	SUMMARY OF FILM PRESENTATION (CONT'D)
6	TEACHING FOR MOTOR SKILL DEVELOPMENT

Operation Sheet
(How to Bore with a Brace and
Auger Bit)

Tools	Materials
1.	1.
2.	2.

Procedure (Notes and Cautions in the Form of Information Points)

Evaluation Questions

Reference (if needed)

VII. Demonstration Evaluation

A. Assesses Student Understanding
B. Gives Instructor Direction

VIII. Preparing to Present the Demonstration

A. Select Demonstration Area
B. Student Viewing
C. Obtain Tools
D. Obtain Material
E. Instructor Practice

Film of an instructor preparing to present the demonstration

IX. Presenting the Demonstration

A. Arrange Students
B. Begin
C. Relate Only Information Points
D. Need for Exaggeration
E. Awareness of Student Understanding

X. Evaluating Demonstration

A. Instructor Prepared Questions
B. Student Questions

Film of instructor presenting a demonstration

XI. Applying the Skill

A. Refer Students to Job Sheet
B. Alertness for Improper Practices

UNIT	TEACHER REFERENCES
5	TEACHING FOR UNDERSTANDING

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Unit 6

Teaching for Motor-Skill Development

TEACHER'S GUIDE

FOR

TEACHING FOR MOTOR-SKILL DEVELOPMENT

UNIT 6

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING

(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining
filmed presentations and seminar discussions
designed to provide twenty-four clock hours
of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 6

INTRODUCTION

The deliberate teaching for motor skill development is a vital vocational teacher competency for it is a task performed many times in each course unit. Although many operations or procedures can be presented before or after the related technical information, there is considerable evidence in the teaching of contemporary occupational skills to favor skill presentation following the technical knowledge. Knowing the how and why of the steps of an operation can cut considerably the practice time necessary for achievement of a specified skill level.

Unless the vocational teacher needs this unit earlier in the course sequence, it should be kept in order and taught following the teaching for understanding lesson. Since this unit is complete in itself, however, it can be presented earlier should the need occur.

UNIT 6 | OBJECTIVES

A student achieving the broad objectives for this course as clarified for this unit should:

(1) Understand and be able to use vocational education terminology common to teaching for motor skill development.
(2) Develop first appreciations and attitudes about the demonstration as a technique for teaching for motor skill development.
(3) Understand the underlying principles and practices involved in planning and presenting a lesson aimed at teaching for motor skill development.

The specific objectives (content) for attainment in this unit are:

STUDENTS WILL UNDERSTAND: cognitive principles, theories, concepts

1. Definitions
   - A. Motor Skill or "Doing Element"
   - B. "Knowing" Elements
   - C. Demonstration
   - D. Operation
2. Ordering "Doing" Elements
   - A. Frequency of Use
   - B. Logical Order
   - C. Student Characteristics
3. Student Motivation
   - A. Intrinsic
   - B. Extrinsic
4. Job Sheet
   - A. Definition
   - B. Functions
   - C. Instructor Check Points
5. Planning Related Information
   - A. Terminology
   - B. Processes Involved
   - C. Safety
   - D. Application
6. Operation Sheet
7. Planning the Demonstration
   - A. Tools Needed
   - B. Materials Needed
   - C. Demonstration Length
8. Planning Demonstration Evaluation
   - A. Assessment of Student Understanding
   - B. Instructor Direction
9. Preparing to Present the Demonstration
   - A. Select Demonstration Area
   - B. Student Viewing
   - C. Obtain Tools
   - D. Obtain Materials
   - E. Instructor Practice
10. Presenting the Demonstration
    - A. Arrange Students
    - B. Begin
    - C. Relate Only Information Points
    - D. Need for Exaggeration
    - E. Awareness of Student Understanding
11. Evaluating Demonstration
    - A. Prepared Questions
    - B. Student Questions
12. Applying the Skill
    - A. Refer Students to Job Sheet
    - B. Alertness for Improper Practices

UNIT 6	LESSON MATERIALS

The following teaching materials are included in this resource resource appendix to help you with the teaching of this unit. You will want to duplicate a number of these materials to distribute to seminar members.

Material

A. The thirty-minute film, "Teaching for Motor Skill Development", may be obtained from the Director, Vocational Section, State Department of Education, Centennial Building, St. Paul, Minnesota 55101.

B. Script of film, "Teaching for Motor Skill Development"

C. "Summary of Film Presentation"

D. Unit 6 Test

E. Unit 6 Test Answer Sheet (keyed)

F. Job Sheet Worksheet

G. Operation Sheet Worksheet

H. Unit References

UNIT 6 SUGGESTED METHOD OF APPROACH*

DISCUSSION LEADER	STUDENT ACTIVITY
1. Introduce unit with "Summary of Film Presentation" hand-out sheet (Sample for duplication in the unit appendix). Advise students that this summary eliminates the need to take notes during the film viewing and that it can also be used later as review material.	1. Review the summary sheet.
2. Arrange for film viewing either individually or in groups.	2. View film for Unit 6, "Teaching for Motor Skill Development".
3. Give Unit 6 Test. (Samples for duplication in the unit appendix). Advise students to mark only the answer sheet so that test forms can be used again.	3. Complete test answer sheet (no time limit).
4. Provide test answers.	4. Correct answer sheet.
5. Initiate discussion from student test responses.	5. Return answer sheets to instructor.
6. Pass our student "Job Sheet Worksheet" (see appendix). Demonstrate how to develop a job sheet.	6. Develop a sample job sheet.
7. Pass our "Operation Sheet Worksheet" (see appendix). Demonstrate how to develop an operation sheet.	7. Develop an operation sheet.

* The same approach can be used for one student or a group of students. While this approach is a suggested one, it is suggested also that the teacher for whom this content is new follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 6	SUGGESTED METHOD OF APPROACH
DISCUSSION LEADER	**STUDENT ACTIVITY**
8. Initiate discussion about the demonstration as a teaching technique and the place of job and operation sheets.	
9. Introduce next course unit and hand out copies of, "Summary of Film Presentation".**	

**This summary may be handed out at the end of the unit for study between class sessions or at the beginning of the seminar discussion.

UNIT 6	UNIT RESOURCE APPENDIX
	TEACHING FOR MOTOR SKILL DEVELOPMENT

RESOURCE MATERIAL

A. Unit Test

B. Unit Test Answer Sheet

C. Unit Test Answer Key

D. Film Script

E. Hand-Out Film Summary

F. Hand-Out - Job Sheet Worksheet

G. Hand-Out - Operation Sheet Worksheet

H. Teacher References

UNIT	UNIT EXAMINATION
6	TEACHING FOR MOTOR SKILL DEVELOPMENT

Directions: Select the one best alternative from among the four alternatives presented in each item. Darken the circle on the separate answer sheet corresponding to the alternative you have selected.

1. Which of the following is not a "doing" skill?

   A. How to select a screw
   B. How to plane a board
   C. How to chisel a mortise
   D. How to solder a joint

2. Which of the following is not a consideration in selecting an "operation" to be taught?

   A. Frequency of use in industry
   B. Appeal to the students
   C. The logical order of skill development
   D. The maturity and dexterity of the students

3. In making an instructional analysis of an occupation, you determine that operation A is performed most often in common jobs of the occupation.

   A. You should teach it first.
   B. You should teach it last.
   C. You should teach it in the middle of the course.
   D. You do not have enough information to make a decision.

4. Which of the following would you teach first to beginning metalworking students?

   A. How to grind a chisel.
   B. How to rough grind a steel bar.
   C. How to file a saw blade.
   D. How to file a steel bar.

5. The primary consideration in selecting a job for students to complete is that it:

   A. be typical of jobs performed in the occupation for which they are training.
   B. contain those operations the instructor wishes to teach.
   C. be simple.
   D. repeat selected operations.

6. Students are generally most highly motivated by the:

   A. exercise method.
   B. job method.
   C. intrinsic method.
   D. operation method.

7. A job sheet outlines:

   A. how a specified operation is performed.
   B. the order in which operations are to be performed as well as how they are performed.
   C. the operations to be performed and the particular order in performing them.
   D. the evaluation questions.

8. An instructor check point is placed on a job sheet where a student is asked to:

   A. perform a difficult operation.
   B. perform a critical operation.
   C. perform an operation new to the student.
   D. make a decision.

UNIT	UNIT EXAMINATION
6	TEACHING FOR MOTOR SKILL DEVELOPMENT

9. Information which is presented during a demonstration is called:

   A. related information.
   B. general information.
   C. specific information.
   D. information points.

10. Information points take the form of:

   A. notes.
   B. cautions.
   C. topics.
   D. both A and B.

11. Stories which provide examples of an instructor's experience in performing a given operation:

   A. should not be told.
   B. should be told in the classroom.
   C. should be told during the demonstration.
   D. should be told either in the classroom or during the demonstration.

12. Cautions relate to:

   A. discipline.
   B. safety.
   C. differences between machines.
   D. general information.

13. Operation sheets list primarily:

   A. related information.
   B. how to complete a job.
   C. a sequence of operations.
   D. steps in performing an operation.

14. Which statement is most correct?

   A. Different instructors teach the same operation differently.
   B. Operations to be taught can be identified best by college professors.
   C. An operation is relatively standard between craftsmen.
   D. Identifying operations is very difficult.

15. Which of the following is not used by the instructor in presenting a demonstration?

   A. Tools needed
   B. Visual aids needed
   C. List of operating steps
   D. related information outline

16. If possible, demonstrations should take about:

   A. 10 minutes.
   B. 15 minutes.
   C. 20 minutes.
   D. 30 minutes.

17. Demonstrations are presented:

   A. where convenient.
   B. in surroundings such as those the student will encounter on the job.
   C. close to the tool cabinet.
   D. in a formal classroom.

18. The initial evaluation of a demonstration is generally made from:

   A. the students.
   B. the instructor.
   C. both A and B.
   D. written tests.

19. The students should practice:

   A. immediately following the demonstration.
   B. after reviewing their related information notes.
   C. during the next class period.
   D. whenever they have time.

20. Students should be allowed continuous practice of a skill:

   A. as they see fit.
   B. without instructor interference.
   C. only if they are performing it correctly.
   D. exactly as it is demonstrated.

UNIT	ANSWER SHEET - UNIT EXAMINATION
6	TEACHING FOR MOTOR SKILL DEVELOPMENT

Name ______________________ Code No. ______________________
Date ______________________ Score ______________________
Discussion Leader ______________________ ______________________

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

Before you begin the examination or while you are waiting for others to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

▼

UNIT 6 ANSWER KEY - UNIT EXAMINATION
TEACHING FOR MOTOR SKILL DEVELOPMENT

Name ____________________
Date ____________________
Discussion Leader ____________________

ANSWERS | **INSTRUCTOR NOTES**

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	●	○	○	○
2.	○	●	○	○
3.	○	○	○	●
4.	○	○	○	●
5.	○	●	○	○
6.	○	●	○	○
7.	○	○	●	○
8.	○	○	●	○
9.	○	○	○	●
10.	○	○	○	●
11.	○	●	○	○
12.	○	●	○	○
13.	○	○	○	●
14.	○	○	●	○
15.	○	○	○	●
16.	○	●	○	○
17.	○	●	○	○
18.	○	○	●	○
19.	●	○	○	○
20.	○	○	●	○

Appendix D

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

FILM SCRIPT	DR. DAVID J. PUCEL
UNIT 6	TEACHING FOR MOTOR SKILL
	DEVELOPMENT PAGE 1

AUDIO	VIDEO
Good evening. My name is David Pucel, and this is the sixth in the series of presentations aimed at introducing prospective teachers to vocational-technical teaching. This session is specifically concerned with teaching for motor skill development. First of all, what is a motor skill? A motor skill can best be defined as a doing skill in contrast to a knowing skill.	
For example, in making coffee the motor skill portion is the actual muscle movement in placing the coffee into the basket and assembling the pot. The knowing portion is exhibited in what coffee is selected and how much coffee should be used. In trade and industrial education motor skills are more commonly called "operations".	
Dr. Kavanaugh has already discussed trade and job analysis, or instructional analysis in an earlier session and how it is used to identify the "doing" aspects, or operations, and the "knowing" aspects, or related information of a trade. Similarly, Dr. Moss has discussed the roles of variables affecting teaching for understanding. With this knowledge as a base on which to begin we will now discuss motor skill development, and in particular, the demonstration which is considered to be the most efficient teaching technique available for teaching the "operations" or motor skill aspects of a trade.	
In any given occupational area, the total number of motor skills involved can be identified by a thorough job analysis of that occupation, but how does the teacher know which of the operations should be taught first and which second and so on. A number of factors enter into this decision.	Superimposed Title No. 1 Identifying motor skills to be taught.
First - What operations are used most by persons working in the occupation as identified by the job analysis, for it is accepted practice to teach those operations which are used most frequently in an occupation first.	

FILM SCRIPT UNIT 6	TEACHING FOR MOTOR SKILL DEVELOPMENT PAGE 2

AUDIO	VIDEO

Second - What is the logical order of skill development in a given occupation that leads to full understanding of the operations, as well as how to perform them. When one makes a job analysis of an occupation he analyzes the products and actions of skilled craftsmen in that occupation. Yet the operations the skilled craftsman uses in his everyday practices may not be appropriate to teach to a beginning student in that occupation.

Example: Although a skilled carpenter may use a circular saw frequently every day, should a beginning carpentry student come into the class the first day and begin using this saw or should he begin with a handsaw and when he becomes more aware of the cutting process and safety factors involved, be taught how to use the circular saw?

A third factor in selecting the operations to be taught is the maturity of the students; are they physically strong enough to adequately perform the operations you would like them to learn? Has the student's dexterity developed to the point where he can adequately do the task you have specified. Although this factor is not a great problem to vocational instructors who deal with older students, it is an important factor when dealing with younger students.

For Example, you would not ask a seventh grade boy to carve an intricate figure out of a hard wood like cherry with a wood chisel or gouge. He is not likely to have the physical strength to operate the chisel nor the dexterity necessary to carve the figure; therefore, he should not be asked to perform the task.

Once the operations to be taught have been selected, how can the students be motivated to learn them. The best motivation is naturally a motivation from within the student himself to possess the skill being taught. If students have this internal or intrinsic motivation, the exercise method can be used. The exercise method is the

AUDIO

method of assigning tasks to students for the sake of their getting practice in a skill. The completion of the task indicates that they have completed the amount of practice required and the product may or may not be useful in and of itself.

However, most teachers do not find students with such a high level of intrinsic motivation. The students like to have the feeling that the product they produce as a result of a number of operations is useful. Therefore, the vehicles used to teach specific operations to vocational students are actual jobs which occur in the occupation they plan to enter. However, although a typical job taken from the occupation has great motivational powers, an instructor must always make sure that the job does not govern what operations are going to be taught. The instructor must determine which operations he would like to teach and how he would like to teach them and find or design a job as an aid in teaching them.

Once the skills to be taught and the order in which they are to be taught has been determined, and an appropriate job has been found, a job sheet should be constructed. A job sheet is a step by step list of procedures the instructor wants the students to follow in completing an exercise or job.

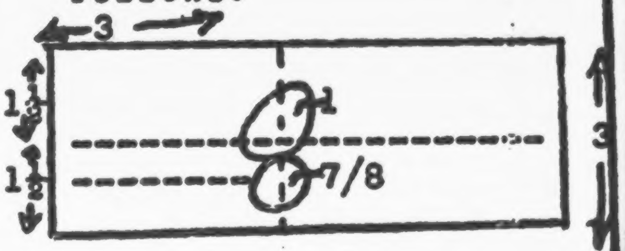
The example shown is the second page of a job sheet for constructing a drilling jig. Notice that the procedure the student must follow is indicated step by step. However, the sheet does not indicate how each operation is performed. The job sheet does not attempt to teach the student how to perform an operation but what operation to perform and the particulars to be observed in performing that operation on the given exercise of job.

For example, step six indicates that the student should perform a boring operation with a brace and auger bit and tells him what size auger bit to use; the drawing tells him where the hole should be located. It does not tell him how to use a brace

VIDEO

Job Sheet
Page 2
(Drilling Jig Job Sheet)
Part II

5. Lay out the centers as follows:



6. Bore 1" hole using a brace and auger bit.

7. Bore 7/8" hole using a brace and auger bit.

8. Sand Part II with #120 sandpaper.

AUDIO	VIDEO

and auger bit. Notice that a small box appears before some of the procedure numbers. These boxes indicate instructor check points. A check point appears whenever a new operation is involved. Notice that steps 5, 6, and 8 are preceded by instructor check points - this indicates that each of these steps introduces an operation that is new to the student.

Step seven is not preceded by a check point because it tells the student to perform the operation that has been introduced in step six. The student is informed that he is not to go beyond a step preceded by a box or check point without having his work inspected by the instructor. This allows the instructor to check the student's performance and help the student if he runs into difficulty. The job sheet is also a ready reference for students at various points in the completion of their jobs, allowing for individual differences.

Now that we have reviewed some of the critical considerations in selecting the motor skills or operations to be taught, and have indicated that they are generally taught by the exercise or job method with the aid of a well-constructed job sheet, how does one instruct students in the development of motor skills?

The most widely accepted method of teaching motor skills, as well as the method believed to be most effective, is the demonstration. It is through demonstrations that the students are shown how to perform the operations referred to earlier in the discussion of a job sheet. We will now discuss what I feel to be the most effective method of organizing and presenting a demonstration. The discussion will be organized in three main parts: (1) planning the lesson, (2) preparing to present the lesson, and (3) presenting the lesson.

Superimposed Title No. 2

1. Planning the lesson
2. Preparing the lesson
3. Presenting the lesson

The procedures that will be discussed are applicable to presenting demonstrations in all trade areas, but because most of us are familiar with woodworking the example which will be referred to throughout this discussion will be how to bore holes in

AUDIO	VIDEO
wood using a brace and auger bit. For those of you who are not quite sure what a brace and auger bit are, the brace is on the right; it is the tool that drives or turns an auger bit. The auger bit, on the left, has a lead screw at the tip which pulls the bit into the wood as the cutting lips cut the wood.	
Assuming the operation to be taught has been selected, in this case boring with a brace and auger bit, what considerations must be made in planning to teach this operation?	Superimposed Title No. 3 Steps in Planning the Lesson
The first of these considerations is - What related information is necessary for the students to better understand the demonstration to be presented by the instructor, and to perform the operation in the laboratory. This information should be presented before the demonstration, and not during the demonstration. Some types of information which should be presented prior to the demonstration are: (a) where the operation is used, (b) new terminology, (c) the processes involved, and (d) safety.	
Before discussing an operation, the instructor should tell the student where it is used and why. If a student sees a need to learn how to perform an operation, you will have less difficulty maintaining his attention. Once the student is motivated the instructor should then define the parts of the tools and the characteristics of the materials to be used in the demonstration.	
The instructor should also explain the functions of the tools in terms of the relationships of the tools to each other and the material to be processed. For example, how does the lead screw of the auger bit relate to the lips of an auger bit and how do they relate to the wood as one is boring.	
Another very important factor which should be covered prior to the demonstration is safety: What should or should not be done with the tools. An instructor who is an expert in a field should not assume safety	

AUDIO	VIDEO

hazards are obvious. All safety precautions should be made explicit.

These are but four examples of the related information which the student should know to make the demonstration more meaningful.

Once the related information concerning the operation to be taught has been outlined, what considerations must be made in planning to demonstrate a given operation.

Most operations are performed in a relatively standard fashion. Although each craftsman may have a slightly different technique in performing an operation, the overall steps are quite consistent between craftsmen. What I am saying is, if you are quite familiar with the trade area you are teaching you will find little difficulty determining what procedure should be followed in performing a given operation. However, this does not mean that you can readily instruct other people to perform that operation.

To help organize their thinking and their demonstrations, many instructors use operation sheets as guides while demonstrating. An operation sheet is a step by step list of procedures one should follow in performing an operation. An instructor may find it helpful to construct his operation sheets on 5 x 8 inch cards like the one shown. It lists the tools needed for the demonstration, the materials needed, the procedure to be followed in presenting the demonstration, notes or cautions the instructor wishes to relate to the students, and the initial evaluation questions.

If you are not familiar with performing a given operation, most trade areas have excellent textbooks which can be used as references.

In planning to present a demonstration, an instructor should ask himself the following questions:

Operation Sheet
(How to Bore with a Brace and Auger Bit)

Tools	Materials
1.	1.
2.	2.

Procedure (Notes and Cautions in the Form of Information Points)

Evaluation Questions

Reference (if needed)

AUDIO	VIDEO
1. What tools will be needed? 2. What materials will be needed? 3. How long will the demonstration take? Accepted practice has established that, if possible, demonstrations should not take longer than 15 minutes.	1. What tools are needed? 2. What materials are needed? 3. How long will the demonstration take?
The length of demonstration time, however is governed by a number of factors: Some of which are the length of time your group can maintain its attention on one topic. An instructor can hold the attention on a group for just so long before the minds of the group begin to wander. How long is that time period for members of your group? Another factor is the operation to be performed (some operations take 10 minutes to perform and some take 20 minutes).	
However, if an operation takes somewhere around 30 minutes to demonstrate, the instructor should examine the demonstration to see if it can logically be broken down into two demonstrations. Although 15 minutes is the accepted length of time for presenting a demonstration, each instructor must use his judgement concerning the appropriate time limit in his situation.	
A planning state which many instructors overlook is planning to evaluate the demonstration. This stage is very important because it gives the instructor direction. Several well-selected questions covering the essential points of the demonstration should be formulated which you can ask the students immediately following the demonstration. Their ability to answer will give you an indication of their understanding of what was demonstrated and indicate to you what should be reviewed. Techniques for further evaluating motor skills will be covered in a later session by Dr. Randleman.	
Although I have outlined the planning of a lesson in three steps:	
1. Planning what the students should know	

AUDIO	VIDEO
2. Planning the demonstration 3. Planning demonstration evaluation you should not think of this planning as completing one step and then moving on to the next, never to return to the first. All three steps must be planned together in order that the totality of the three steps form a clear lesson.	
For instance, after you have planned the related information to be presented, and have begun to plan the demonstration, you may find that another topic of related information should be included. Therefore you would go back and revise the related information section.	
Assuming that you have thoroughly planned the lesson, preparations for presenting the lesson should be made. Preparations for presenting the related information should be made in accordance with what Dr. Moss presented in his session on teaching for understanding. I will now discuss preparing to demonstrate which will later be illustrated in a short film of an instructor preparing a demonstration.	Superimposed Title No. 4 Steps in Preparing to Present the Lesson
In preparing to present the demonstration, the first consideration is to select an appropriate place to demonstrate. The demonstration environment should approximate as closely as possible the actual situation in which the student is expected to perform. It should be well-lighted and readily accessible to all of the students. Notice that the woodworking demonstration will be presented in a woodworking shop and not in a metalworking shop.	
The instructor should then obtain all of the tools necessary and make sure the tools are in excellent condition and in proper adjustment. Once the tools are gathered, they should be arranged neatly on the demonstration area in the order in which they will be used. It is very distracting for students to wait for an instructor to find a tool once the demonstration has started.	

AUDIO	VIDEO

He should also obtain the necessary materials. Do not use a student's project to demonstrate on. All students should perform all of the operations. Get a piece of new stock which is the same size and type as that which the students are using.

Finally, have the evaluation questions prepared and available. If you have prepared an operation sheet for the demonstration, the questions should be on it.

We will now watch Mr. Miletich prepare to demonstrate how to bore with a brace and auger bit.

Film illustrating the above discussion concerning how to prepare to demonstrate

Once everything is set for the demonstration, it is advisable to go through the demonstration at least once. Most instructors give a demonstration on a given operation once or twice a year and lose their touch, so to speak. Therefore, in order that the demonstration will go smoothly, the instructor should practice before presenting it. The demonstration should serve as a model for the students and be as technically correct as possible.

So far, we have discussed planning a lesson and preparing to present the lesson.

Now that all preparations have been made, we are ready to discuss presenting the lesson.

As indicated previously, the related information should be presented according to the procedures and techniques indicated in the session on teaching for understanding prior to the demonstration.

Superimposed Title No. 5

Steps in Presenting the Lesson

I will now discuss presenting a demonstration after which we will see Mr. Miletich perform the demonstration.

After the related information pertinent to the operation to be demonstrated has been presented in the classroom, the students should be lead into the demonstration area in an orderly fashion. The instructor should make sure that all of the

AUDIO	VIDEO
students can see the demonstration area and hear him. He should then proceed through the demonstration according to his operation sheet or demonstration plan.	
A number of important points which the instructors should remember during a demonstration are: (a) He should say only things which are essential to understanding what is being demonstrated. (b) During the demonstration the instructor should make sure that the students can adequately see his every move. In some instances, it may help to exaggerate some steps. Example: The chuck of a brace can be tightened onto an auger bit nicely with little movement. However, unless the movement is exaggerated during the demonstration and made visible to the students, they may not be aware of what you are doing. (c) He should also be responsive to indications of inability on the part of the students to understand what he is doing. If this occurs, he may have to repeat a step. (d) After the demonstration, it should be evaluated.	Demonstration of Essentials 1. Essential 2. Exaggerate 3. Responsive 4. Evaluation
Although we have discussed the initial evaluation of a demonstration in terms of questions which the instructor asks the students upon completing the demonstration, another important evaluation technique is that of simply asking the students if they have any questions. Based on the types of questions which the students ask and the answers which are given to the prepared questions the instructor can get a good indication of the students' understanding of the demonstration.	
We will now observe Mr. Miletich as he demonstrates to the class.	Film illustrating presenting a demonstration
Throughout this discussion, I have not mentioned the try-out or practice portion of the demonstration lesson. In effect, a person has planned the practice the student will get when he plans the job sheet. It outlines the type of practice and the amount of practice the students will perform after each demonstration.	

An opportunity for students to practice after each demonstration is essential to the learning of a skill. If practice is delayed, the students will forget many of the details involved in performing the operation.

Immediately after the demonstration the students should be referred to the particulars of how the operation is to be performed on their given jobs or exercise as outlined on their job sheets. Then allow them to start practicing the demonstrated operation on their own jobs.

Once the students have begun to perform the demonstrated operation the instructor must observe each student to make sure he is performing the skill correctly. If he is, the instructor should allow him to proceed without interference.

If he is not performing the skill correctly, however, the instructor must correct him immediately, for if a student practices performing a skill incorrectly and learns the skill incorrectly it will be very difficult for him to perform the skill correctly later. For example, if a student learns to drive nails while grasping a hammer near the head, it will be very difficult for him to use a hammer while grasping it correctly near the end.

You may also have noticed that throughout this discussion I have been assuming that all students will be ready for a given demonstration at the same time. This is generally not so. Most classes are not homogenuous and students work at different rates of speed; therefore, they generally are not all ready for the demonstration at the same time. This situation poses additional burdens for the vocational instructor. You may have to give individual demonstrations to very fast or very slow students as they are needed as well as a general demonstration to the group.

As you can see, much planning must go into presenting a good demonstration. The instructor must know how to select the appropriate operation to demonstrate, what type of group he is dealing with (are they young, old or experienced, inexperienced, etc.), and the technical aspects of the operation he is going to demonstrate. He must prepare an operation sheet, must provide for student practice, and he must prepare for demonstration evaluation.

I have tried to give you an overview of how an instructor goes about teaching for motor skill development. Although we have touched upon many of the aspects of teaching for motor skill development, which I feel are important, you should not feel that I have covered them all. Most textbooks on trade teaching techniques devote at least one chapter to this topic, and numerous articles have appeared in professional journals. I hope that I have aroused your interest in the teaching of trade and technical skills and that you will seek more information on your own.

The next course unit is entitled "Teaching with Instructional Aids". In this unit, you will study various types of instructional aids which can help you in teaching for understanding and skill development.
Good night, and before you meet for your seminar discussion session, why don't you think about planning a demonstration for an operation you would like to demonstrate.

UNIT	SUMMARY OF FILM PRESENTATION
7	TEACHING WITH INSTRUCTIONAL AIDS

This summary for Unit 7 is planned for student use before viewing the video presentation (film or television). It is suggested that this outline be given to students at the close of Unit 6 as shown in the "Method of Approach" for Unit 6. In addition to a preview, the outline can also serve as review notes for this unit. The information outlined in the blocks below is a duplicate of the video materials shown during the video presentation.

Unit 7 Summary Review

I. Audio-Visual Materials

A. Power tools for teaching
  1. extension of teaching potential
  2. reaching students

B. Tools for motivation and challenge

C. Tools for objectives achievement

II. Audio-Visual Materials as Communication Tools

A. Transmission of ideas

B. One mind affecting another

C. Direct-straight across communication

D. Distraction or static

E. Transmission senses
  1. eye
  2. ear
  3. touch
  4. cross-media

III. Word Communication

A. Spoken word

B. Printed word

C. Visualized word

IV. Dr. Edgar Dale's Cone of Experience

1. Verbal symbols
2. Visual symbols
3. Radio - Recordings - Still pictures
4. Motion pictures
5. Television
6. Exhibits
7. Field trips
8. Demonstrations
9. Dramatized experiences
10. Contrived experiences
11. Direct experiences

UNIT	SUMMARY OF FILM PRESENTATION (CONT'D)
7	TEACHING WITH INSTRUCTIONAL AIDS

V. Selection of Audio-Visual Media

- A. Objectives
- B. Student characteristics
- C. Learning situation
- D. Motivation and challenge

VI. Channels of Communication

- A. Audio
- B. Visual
- C. Other sensory
- D. Multi-media

VII. Audio-Visual Use

- A. Equipment care
- B. Craftsmanship in using
- C. Equipment limitations
- D. Materials storage and care

VIII. Common Kinds of Audio-Visual Equipment

- A. Overhead projector
- B. Transparencies
  - 1. 35mm slides
  - 2. film strips
  - 3. 8mm motion film
  - 4. 16mm motion film
- C. Opaque projector
- D. Polaroid pictures
- E. Chalk board
- F. Audio tape recordings
- G. Video tape recordings

Appendix F Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	JOB SHEET WORKSHEET
6	TEACHING FOR MOTOR SKILL DEVELOPMENT

Job Sheet Worksheet

__Directions:__ Develop a sample job sheet with the first six procedure steps for a typical job in your vocational-technical speciality. Each procedure step should indicate what operation is to be performed and the particulars needed to determine how it is to be performed on the given job.

MODEL:

Job Title

Tools needed:	Materials needed:
1.	1.
2.	2.

List of Procedures

1.
2.
3.
4.
5.
6.

Appendix G

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	OPERATION SHEET WORKSHEET
6	TEACHING FOR MOTOR SKILL DEVELOPMENT

Operation Sheet Worksheet

Directions: Develop an operation sheet for an operation called for in one of the six procedure steps you outlined on your sample job sheet.

MODEL:

Operation Sheet Title

Tools needed:	Materials needed:
1.	1.
2.	2.

List of operating steps

1.
2.
3.
4.
etc.

("NOTES" OR "CAUTIONS"
IN THE FORM OF INFOR-
MATION POINTS)

Evaluation questions:

1.
2.

UNIT	TEACHER REFERENCES
6	TEACHING FOR MOTOR SKILL DEVELOPMENT

References:

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Unit 7

Teaching with Instructional Aids

TEACHER'S GUIDE

FOR

TEACHING WITH INSTRUCTIONAL AIDS UNIT 7

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining filmed presentations and seminar discussions designed to provide twenty-four clock hours of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 7	INTRODUCTION

Units 7 and 8 of this course are planned to provide understanding for the development and use of audio and video instructional aids in vocational school teaching. In the first of these units, Teaching with Instructional Aids, the author places most emphasis on effective communication in teaching for achievement of unit and lesson objectives. In Unit 8, Developing Instructional Aids, most attention is given to resources and methods in developing instructional aids.

It is suggested that Units 7 and 8 be kept in sequence and not be taught in reversed order as much of the sense and logic will be last, however, if the teaching situation should dictate a change in unit order, both Units 7 and 8 kept as a block could be presented either following Unit 6 or Unit 9 with no loss of continuity or logic.

UNIT 7 OBJECTIVES

A student achieving the broad objectives for this course as clarified for this unit should:

(1) Understand the purpose and function of instructional aids in specific objectives achievement.
(2) Be able to choose an instructional aids for a given specific objective.
(3) Understand nature of instructional aids as media for communication of ideas.

The specific objectives (content) for attainment in this unit are:

STUDENTS WILL UNDERSTAND: cognitive principles, theories, concepts

1. Audio Visual Materials
    - A. Power tools for teaching
    - B. For motivation-challenge
    - C. Objectives achievement
2. Audio Visual Materials as Communication Tools
    - A. Talking communication
    - B. Transmission of ideas
    - C. Communication elements Teacher-Media-Student
    - D. Distraction and static
    - E. Ear, eye, cross-media
3. Communication and Words
    - A. Spoken
    - B. Printed
    - C. Visualized
    - D. Word speed vs. ideas
4. Edgar Dale Cone of Experience
    - A. Direct, purposeful
    - B. Contrived
    - C. Dramatized
    - D. Demonstration
    - E. Field trip
    - F. Exhibit
    - G. Television
    - H. Motion pictures
    - I. Recordings
    - J. Visual symbols
    - K. Verbal symbols
5. Selection of Audio Visual Media
    - A. Objectives
    - B. Student
    - C. Learning situation
    - D. Motivation and challenge
6. Channels of Communication
    - A. Audio
    - B. Video
    - C. Sensory
    - D. Multi-media
7. Audio Visual Materials Use
    - A. Equipment care
    - B. Craftsman performance
    - C. Equipment limitations
    - D. Materials care
8. Common Audio Visual Equipment
    - A. Overhead projector
    - B. Transparencies
    - C. 35mm slides
    - D. Film strip
    - E. 8mm film
    - F. 16mm film
    - G. Opaque projection
    - H. Polaroid
    - I. Chalk board
    - J. Tape Recorder

UNIT 7	LESSON MATERIALS

The following teaching materials to help you with the teaching of this unit are included in the resource appendix to this unit. You will want to duplicate the number of necessary copies to use as you lead the seminar discussion.

Material

A. The thirty minute film, "Teaching with Instructional Aids", may be obtained from the Director, Vocational Section, State Department of Education, Centennial Building, St. Paul, Minnesota 55101.

B. Script of the film, Teaching with Instructional Aids

C. "Summary of Film Presentation"

D. Unit 7 Test

E. Unit 7 Answer Sheet Sample

F. Unit 7 Answer Sheet (keyed)

G. Student Activity Sheet

H. Teacher References

UNIT 7 | SUGGESTED METHOD OF APPROACH

DISCUSSION LEADER	STUDENT ACTIVITY
1. Introduce unit with "Summary of Film Presentation" hand-out sheet (Sample for duplication in the unit appendix). Advise students that this summary eliminates the need to take notes during the film viewing and that it can also be used later as review material.	1. Review the summary sheet.
2. Arrange for film viewing either individually or in groups.	2. View film for Unit 7, "Teaching with Instructional Aids".
3. Give Unit 7 test. (Samples for duplication in the unit appendix).	3. Complete test answer sheet (no time limit).
4. Provide test answers.	4. Correct answer sheet.
5. Initiate discussion from student test responses.	5. Return answer sheets to instructor.
6. Review Edgar Dale's "Cone of Experience".	
7. Hand out copies of "Cone of Experience" and "Student Activity Sheet". (See appendix)	7. Review hand-out sheet.

*The same approach can be used for one student or a group of students. While this approach is a suggested one, it is suggested also that the teacher for whom this content is new follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 7 | SUGGESTED METHOD OF APPROACH

Continued ----

DISCUSSION LEADER	STUDENT ACTIVITY
8. Elicite examples of the various levels of experience listed in the "Cone of Experience".	8. Complete Part 1 of student activity sheet.
9. Review audio visual equipment and materials introduced in film presentation.	9. Become familiar with equipment, materials, and terminology.
10. Illustrate function and usage of audio-visual equipment and materials.	
11. Initiate discussion about methods and procedures in utilizing audio-visual equipment and materials in the classroom.	11. Complete Part 2 of student activity sheet.
12. Hand out "Teacher References" sheet (See appendix).	
13. Introduce next course unit and hand out copies of "Summary of Film Presentation" for Unit 8.	

UNIT	UNIT RESOURCE APPENDIX
7	TEACHING WITH INSTRUCTIONAL AIDS

RESOURCE MATERIAL

A. Unit Test

B. Unit Test Answer Sheet

C. Unit Test Answer Key

D. Film Script

E. Hand-Out Film Summary

F. Hand-Out - Practice Sheet - Cone of Experience

G. Hand-Out - Practice Sheet - Student Activity Sheet

H. Teacher References

UNIT	UNIT EXAMINATION
7	TEACHING WITH INSTRUCTIONAL AIDS

Directions: This examination is designed to evaluate your learning for the formal video or film presentation part of this unit of study. Answer each item by darkening the appropriate letter of your choice on the answer sheet. Do not make any marks on this test form.

1. Learning, teaching, education is basically:
   A. Verbal communication
   B. Motivation
   C. Sensory communication
   D. Application

2. In the opinion of the video lecturer, the most valuable tool for teacher made instructional aids is the:
   A. Transparency maker
   B. 35mm camera
   C. Chalk and chalkboard
   D. Dry mount press

3. The projector which utilizes any book, newspaper, student work, or flat pictures is the:
   A. Overhead projector
   B. Film strip projector
   C. Single concept projector
   D. Opaque projector

4. The felt or flannel board is intended primarily for:
   A. Demonstration
   B. Interpretation
   C. Manipulation
   D. Enlargement

5. A principal reason for using a film in any particular teaching situation would be:
   A. It compels attention bettwe than other audio visual materials.
   B. It gives better understanding of relationship of ideas.
   C. It achieves the purpose better than other audio visual materials.
   D. It is more realistic than other audio visual materials.

6. Which of the following factors is of most importance in judging the potential value of an educational motion picture?
   A. The purpose of the producer making the film.
   B. The producer of the film.
   C. The authenticity of the film.
   D. The apparent effect of realism of the film.

X

UNIT	UNIT EXAMINATION
7	TEACHING WITH INSTRUCTIONAL AIDS (CON'D)

7. Audio visual aids best enhance the process of education by:
   A. Providing experiences out of which generalizations are developed
   B. Enabling teachers to become more specific in their teaching.
   C. Making pupils less verbally minded
   D. Gradually replacing verbal symbols

8. The meaning of a word is most dependent on an individual's
   A. Experience
   B. Verbal facility
   C. Education
   D. Knowledge of the dictionary definition

9. The relationship of audio visual materials to teaching is:
   A. Complementary
   B. Dependency
   C. Supplementary
   D. Substitution

10. Verbalism as used in the video presentation is best explained by:
    A. Mispronounciation of the words
    B. The use of more words than necessary to express an idea or thought
    C. The use of words by a speaker which are not likely to be understood by the audience
    D. The use of words which are not understood by the user

11. For showing an object in its natural setting you would select:
    A. A diorama
    B. A colored sound motion picture
    C. A field trip
    D. A mock up of a classroom

12. The educator known for his communication model which summarizes the interrelationship of various types of audio visual materials in pictorial form is:
    A. James S. Kinder
    B. Walter A. Wittich
    C. James W. Brown
    D. Edgar Dale

13. Material for projection in the opaque projector should not be:
    A. In color
    B. Transparent
    C. Flat mounted
    D. Held down to insure sharp focus

UNIT	UNIT EXAMINATION
7	TEACHING WITH INSTRUCTIONAL AIDS (CON"D)

14. The value of an audio visual material is not determined by:
    A. Its realism
    B. The intellectual maturity of the learner
    C. The extent to which it is used in the classroom
    D. The pupils experience

15. Which of the following is not a criterion of all projected visual materials?
    A. Purpose
    B. Composition
    C. Sequence
    D. Accuracy

16. Which of the following is not an advantage of the opaque projector?
    A. Room darkening is optional
    B. Simple to set up and operate
    C. It is useful in many subjects and on many grade levels
    D. Pages from books and magazines can be projected directly

17. Which of the following is not essential in the use of audio visual materials?
    A. Critical selection
    B. Perfected presentation
    C. Creative utilization
    D. Continuous follow through

18. In the selection of audio visual materials you should:
    A. Use materials that may be available
    B. Use materials that will "fill" the class period
    C. Always make your own
    D. Be practical

19. The big advantage of a direct wire TV camera and its receiver used in the classroom is:
    A. Spanning time and distance
    B. Immediacy
    C. Motion realism
    D. Focusing attention on the screen

20. The most important principle of learning underlying the use of the hatchet during the video program was:
    A. Keep the audience awake
    B. Demonstrate how heavy objects are attached to a hook and loop board
    C. Demonstrate the versatility of hook and loop material
    D. Arouse interest to emphasize a point

UNIT	ANSWER SHEET - UNIT EXAMINATION
7	TEACHING WITH INSTRUCTIONAL AIDS

Name ____________________ Code No. ____________________
Date ____________________ Score ____________________
Discussion Leader ____________________

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

Before you begin the examination or while you are waiting for others to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

UNIT	ANSWER KEY - UNIT EXAMINATION
7	TEACHING WITH INSTRUCTIONAL AIDS

Name ____________________
Date ____________________
Discussion Leader ____________________

ANSWERS	INSTRUCTOR NOTES

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	●	○
2.	○	●	○	○
3.	○	○	○	●
4.	●	○	○	○
5.	○	○	●	○
6.	○	○	○	●
7.	●	○	○	○
8.	●	○	○	○
9.	○	○	●	○
10.	○	○	○	●
11.	○	○	●	○
12.	○	○	○	●
13.	○	●	○	○
14.	○	●	○	○
15.	○	●	○	○
16.	●	○	○	○
17.	○	○	●	○
18.	○	○	○	●
19.	○	●	○	○
20.	○	○	○	●

FILM SCRIPT	DR. NEVILLE PEARSON
UNIT 7	TEACHING WITH INSTRUCTIONAL AIDS

AUDIO

Good evening. I am Neville Pearson here to welcome you to this seventh session of Introduction to Vocational Technical Teaching. As vocational-technical instructors, you are well acquainted with tools. I would like to discuss with you this evening some of the audio visual tools that are going to extend your potential in teaching and reaching your students. The use of audio-visual tools in teaching I will call audio-visual methods in vocational-technical teaching.

Too many teachers in the teaching process are not effective in communication. Learning, teaching, and education is communication; and yet we have so very many teachers who feel that all that they can do in the classroom is to talk and talk and talk and talk, and if they stop talking, they have stopped teaching.

Now, communication is ways in which one mind may affect another. It is the transmission of ideas, and in the transmission of these ideas, we have always two elements. We have the teacher who is attempting to send a message and we have the student who we hope is receiving the message. And if everything is going the way it should, there is direct, straight-across communication. But in almost every ordinary classroom situation there are going to be minor distractions. Shall we say statis that interrupt the flow of ideas. You as the teacher have to be sure that you reach the receiver and sometimes you will simply blast right straight through. On other occasions you're going to work around the problem. Sometimes you're teaching in the evening, late afternoon when student is tired; maybe the student is thinking about things at home; maybe you just don't get through to the student with the spoken word. This is where the use

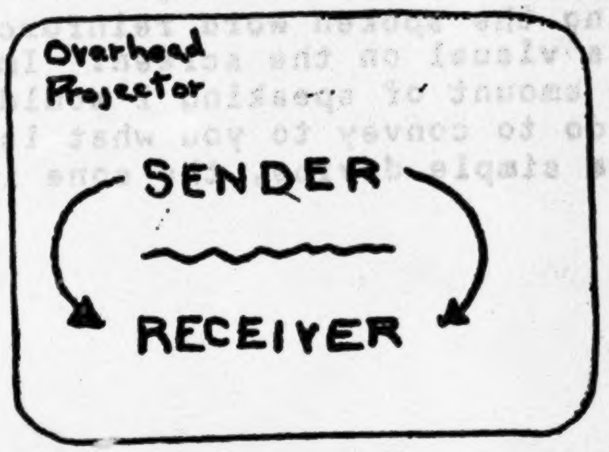
VIDEO

Overhead
Projector

TALK TALK
TALK

Overhead
Projector

COMMUNICATION
WAYS
ONE MIND MAY EFFECT
ANOTHER.
TRANSMISSION OF IDEAS



AUDIO

of a variety of audio visual materials is going to make such a very big difference. You are going to use not only the channel of the ear, but you're going to use the eye, the combination, so that in every instance you are using all communication channels at your disposal to reach the student in your class.

Now, when we think of communication we think of the spoken word, the printed word, the visualized material. We have to keep in mind that words, words, words, and still more words are not enough. Educator Horace Mann made this statement that explains why words alone are not going to do the job. One thing should be insisted upon. From the beginning, and especially at the beginning, no word should be taught whose meaning is not completely understood. The teacher should be laid in the reading of the very first lesson of regarding words as the names of things, as belonging to something else, and not something by themselves.

Dr. Edgar Dale, of Ohio State University, has designed this communication model which he calls "the cone of experience". At the top we have the spoken word which is so convenient for communication when the student has had a basis for understanding that word. A direct, purposeful experience of some sort. Now, the classroom teacher cannot always give direct experience in the classroom.

Then you have to use these inbetween steps in the cone. Right now I am using the spoken word reinforced with this visual on the screen. Imagine the amount of speaking I would have to do to convey to you what is meant by a simple device, the cone is. You

VIDEO

Overhead Projection

ORAL
PRINTED } WORDS

VISUALIZED - MATERIAL

Overhead Projection

WORDS

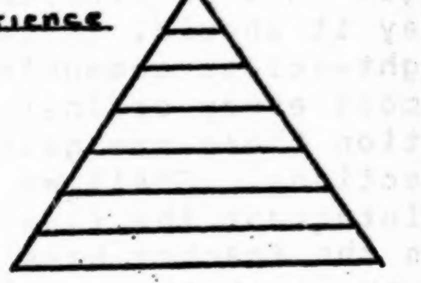
WORDS

WORDS

HORACE MANN
FILMSTRIP

Overhead Transparency

Cone of Experience



AUDIO

have had a variety of experiences, and yet, unless you happen to see this in some particular education text, the changes are good that you might not grasp from words alone the meaning of this particular diagram with the still picture projected on the screen. It does become almost immediately meaningful to you. As a teacher, this is what you want to keep in mind in your classroom. You don't want to use the spoken word or the printed word unless the student is going to understand it. Now, you might use a simple still illustration on the overhead projector, slide projector, as I am doing now. You might use motion pictures. Motion pictures can do so many things, and they are almost stand-in for direct experience education. You can use television, you can use television that comes into the classroom, you can use television within the classroom to amplify small demonstrations. You can use exhibits, you can have out-of-the-classroom experiences, you can use demonstrations. And then you get into the bottom area of the cone where the student actually becomes involved. These are sometimes more complex situations to bring into the classroom. You can't always contrive, you can't always do the job of role-playing, you can't always use the direct, purposeful experience. So this is wny you have to know these various areas for effective communication. For all of us in teaching, the challenge is improved instruction. We want to do the very best job every single time that we meet our classes. We want to do things the right way. And, of course, the right way is the very best that you can give your students in every classroom, every teaching situation.

Audio visual materials are not an easy way, but they are a better way for you to communicate with the student. Now, as a teacher, you want to ask these questions: What is it that I am

VIDEO

Overhead
Projector

THE CHALLENGE
IMPROVED
INSTRUCTION

Overhead
Projector

A-V MATERIALS
NOT AN EASY WAY
BUT
A BETTER WAY

AUDIO	VIDEO
saying? To whom? What is the class? What is their particular background? Each class you work with is going to be different. Why is this particular lesson an important one? How can it be said most effectively, most efficiently in the time that is available? This is where you're going to have to think back to the various communication steps that you might use. Sometimes you're going to select the motion picture. On other occasions it's going to be a simple illustration on the chalk board. Always, instructors, put yourself in the place of the student, and be sure that you realize that the words that are so meaningful to you are not necessarily going to be understood by the student unless you have given him a basis for understanding.	Overhead Projector WHAT AM I SAYING? TO WHOM? WHY? HOW CAN IT BE SAID MORE EFFECTIVELY? Overhead Projector TEACHER PUT YOURSELF IN THE PLACE OF THE STUDENT. WHAT ARE YOU TRYING TO DO.
Some other important questions that you must ask as you select the right material, you want to check on what it is that you're trying to do. In the previous sessions, you've learned something about establishing your objectives. You want to ask what it is that should result. How is the student to change from this particular lesson? Am I trying to give him information? Am I trying to get the student to take action? You want to be very sure that you define your objectives in terms of the results; you want to tailor your materials to the particular class, the particular group that you are working with. You want to use the tools, the techniques that will help you do the job the best way possible. And always, you do want to be sure that you do challenge the viewer.	Overhead Projector WHAT SHOULD RESULT CHANGE INFORMATION ACTION Overhead Projector DEFINE YOUR OBJECTIVES TAILOR MATERIALS USE TOOLS-TECHNIQUES CHALLENGE THE VIEWER.
Now, show your students what it is that you're saying. Use a variety of materials, use the audio channel, the visual channel, the sensory channel, use cross-media, use multi media; be sure that you try to communicate with every student in your class just as	

AUDIO	VIDEO

efficiently as you can. As an instructor, you should know the resources that are available to you. You should develop skills in using these resources; you want to be sure that you dare to experiment. Sometimes a new idea may seem unusually good; you try it out, you modify it, you'll find that just a little bit of change is going to bring the result that you want. But as a teacher, just as in a shop in which you're working, you want the students to know the various materials that they're working with.

You, as the instructor, have to be well aware of all of the audio visual materials that you might use and you do have to know how to use them effectively. If you can't use the materials the way that they should be used, then you're better off not trying to use them. You must be able to handle the equipment. Perhaps some of you are going to have student assistants who will operate motion picture projectors, film strip projectors, recorders, and so on. But, even then, you as the instructor are in charge and it is up to you to see that you do handle the equipment when you're doing the teaching job.

It is also desirable that you as the teacher should know how to make some of the simple audio visual devices. How do we make transparencies? How do we use a 35mm slide camera? How can we supplement the textbook, the other experiences that we have available to us in the classroom. Each of these materials is going to have certain advantages. They're also going to have certain limitations; as an instructor you want to be aware of the advantages that do make a difference. Why do you use a film? Why do you use the overhead projector, which I am using right now. What are the limitations of, say, the opaque

Overhead Projector

SHOW THEM
WHAT YOU SAY
USE
CROSS-MEDIA
MULTI-MEDIA

Overhead Projector

KNOW YOUR RESOURSES
DEVELOP SKILLS
DARE
TO EXPERIMENT

Overhead Projector

KNOW
ADVANTAGES
DISADVANTAGES

AUDIO	VIDEO
projector, which requires a very well-darkened room. What are some of the limitations of some of the other tools that you might wish to consider using. You want to check and to be sure that the material is practical for you. There's no sense in going to a great deal of expense, trouble in finding material that won't help you do the job. You want always to think in terms of the objective that you have established, and come up with the materials that will help you to do the job.	Overhead Projection APPROACH MOST PRACTICAL FOR YOU?
Now, let's look at some of these various tools that will be practical for you to use. Certainly all of you should be able to use the chalk board and chalk. Simple, quick illustrations are going to make a very big difference in communicating with your students. These are the non-projected materials which are so flexible, so inexpensive for you to use. You're going to use felt pens which will make it possible for you to quickly prepare charts, graphs, other simple sketches that aren't necessarily enlarged with a projection device. You're going to know how to use something like your little tape recorder that will take pictures in sound. You can take this recorder with you because it is battery operated, it will capture on location sounds, it will caputre interview materials. These things that you will want to bring back to your own class. And another very good way to use any tape recorder is to have to play this back before any supervisor, just listen to it yourself. You'll find out quickly the small mistakes that you might be making as you're talking with your students.	Demonstration. TOOLS CHALK BOARD FELT PENS TAPE RECORDER MATERIALS HELD UP AND POINTED OUT BY DR. PEARSON
We would like to have you know something about using camera equipment. Here is the polaroid camera which	

AUDIO	VIDEO

does take your pictures in just a matter of seconds and makes them available for you to see. You're thinking in terms of efficient, effective communication with your students. Sometimes this non-projected still picture is going to help do the job.

On other occasions you're going to step into the use of your 35mm camera and prepare photographic slides. It will share your ideas on film, usually in color, with the class. You don't have to be a specialist in photography, but learn how to use this instrument. There is no tool that I can suggest to you that is going to be more effective in the teaching process than your 35mm camera.

Your 35mm slide projector, and here we have one of the automatic models, that will permit you to sequence your slides in any fashion you want and to enlarge them to any size on the screen.

Let us consider some of the advantages of projected material. They do command attention. Anytime you put an image on the screen, you're going to know that your students do look at that screen. You're going to provide a very high degree of realism. The slides that you might make with your 35mm camers, the motion pictures that you might bring into your classroom from commercial producers are going to bring the world to your students. Everyone looking at the screen is going to have the same experience at the same time. We might ask the students to turn to a page in a book to look at a picture, but we know that many students are going to stop a few pages short to look at an illustration ahead of the one that you want them to see, others are going to flip by, and consequently it will be many moments before everybody is looking

AUDIO	VIDEO
at the text picture that you had called to their attention. When the material is on the screen, well, everybody will see the same thing at the same time. Now, other projection devices would include this rather large opaque projector. It's certainly a useful device because it takes any textbook, newspaper material, anything that is opaque, flat, even three dimensional objects that aren't too bulky, and be put into the stage of the opaque projector. But you do have to again think of the limitations that require a very well darkened room. It is a little bit bulky and awkward to carry around. Often times your shops are not going to have quite enough darkness for efficient use of the opaque projector. The film strip projector - here we have a rather small model - is going to be convenient for you to use, for individual students to use. The filmstrip material is so widely available and so inexpensive. This sort of material is one of the best types of still picture materials that I can recommend to you. We switch from still to motion and we use one of our 16mm projectors in our catalogues; in our film libraries, we have quantities of film that are available for you to use on rather short notice. You do have to plan ahead, you have to book these materials; certainly you want to know how to use these materials in your class. But think of the things that a motion picture can do. Things that are too big to ordinarily share with the class. Things that are too small, things that are too far away, things that cannot be seen at all, can be made visible through animated photography. Many schools and instructors	

AUDIO	VIDEO
now are considering the use of small 8mm projectors, such as this single concept projector which would have its film in a small cartridge like this. This is simply inserved into the projector; the student can view the film just as many times as necessary to learn the operation, the skill, whatever is contained on the film.	
The overhead projector that I have been using is a very valuable tool, particularly when you have some device in making transparencies. There are so many transparent masters that are now on the market that permit you in matters of seconds to take care of basic wiring, auto body repair, auto testing, the charging system, electricity, semi-conductors. These are some of the things that are available in commercial form for you to use with the overhead projector. One of the advantages here is that it doesn't require a completely darkened room. All of these projectored materials are part of the bag of tools, the kit of tools that you have available.	
One of the newest tools would involve direct wire television. With inexpensive camera, monitor that we have here, you can enlarge small operations so that one of the suburban Minneapolis schools, the shop instructor said he had saved some thirty hours of instruction when he was using the direct wire television as opposed to his old method of showing his students how to weld - three or four students at a time. The television camera, with an operator at the front of the classroom, brought a front seat view to every single student in the class.	
Well, all of these tools are yours to consider using. Now, what sort of a criteria do you keep in mind as you	

AUDIO	VIDEO
select the materials to do a particular job. First of all it is important that your tool be a simple, easy one to use. It should be something that is going to be completely manageable. You do want to be sure that the material that you select is accurate. You don't want to give your students the wrong impression. It must be material that is realistic. As you select a film, filmstrip, or picture, certainly it should be as real as it possibly can be. You want to think of the people in the back of the room. Is it going to be completely legible. This is where projected materials will have advantages over non-projected materials which cannot always be big enough to meet the needs of the classroom, the class size. And you want to select colorful material. We don't live in a black and white world; black and white pictures will do a good job, but certainly if you can inject color you want to keep this extra material, this extra plus of realism in mind as you select the film, the filmstrip, the transparency. Something that is simple, something you can handle that gives an accurate, realistic picture that's going to be viewed by everybody, and something that is colorful will add up to a good aid. Now, as you select your materials, be sure that you select something that does meet the needs of the class. Not just any material that might be available. Know how to operate the equipment. Have a perfected presentation. I am sure that many of you have been present in a classroom situation where someone was going to show a film, and they thread the motion picture projector, they fiddle around, have a little difficulty because they don't know how to operate the device. Finally they get it threaded. They turn it on and you	Felt Board SIMPLE MANAGEABLE ACCURATE REALISTIC LEGIBLE COLORFUL

AUDIO	VIDEO
see a blur on the screen. The picture is out of focus. Well, by the time they get the focus adjusted, the title is past and you never know what particular picture it is that you are witnessing. Then they discover that they haven't turned on the sound. So they turn up the volume; well, the amplifier takes a few moments to warm up, and they again turn the tone control, do something else that is just delaying. And, of course, when the amplifier warms up and the volume is full blast, then the sound blasts forth and completely destroys any climate for learning that may have been established as the person introduced the film. Well, don't just stop your film and say that's it for today, gentlemen. Have whatever follow up is necessary and desirable. You want to be sure that you follow through so that you get from that material just as much as you possibly can.	
Select your materials carefully. Materials that will fit the job. Make a smooth presentation and follow through, so that you get from any film, any filmstrip, any recorded material that you use just as much as you possibly can. If you have selected the materials carefully, the chances are very good that the students are going to learn faster. Anything that we can do to speed the learning process is always good, because there is so much that has to be covered, so little time to do the job. If you have given those students a clear picture, they're going to remember longer, because, afterall, you don't want them to just remember for final examination, you want to give them take home learning that is going to stay with them for life. And most important of all, of course, is the fact that if they have gotten a clear	Felt Boord • CRITICAL SELECTION • PERFECTED PRESENTATION • CONTINUOUS FOLLOW-UP Felt Boord • LEARN FASTER • REMEMBER LONGER • UNDERSTAND BETTER

AUDIO	VIDEO
picture, they're going to understand. This is what we're really trying to do. Communicate efficiently, effectively with our students, so that they do understand just as clearly as we possibly can make them understand. Well, the tools to speed the learning process, to impress the memory, to help the students understand, are at your disposal. You the teacher are going to make the selection of those particular tools. It's up to you to decide just which of the many tools available for you to use you're going to use for this particular lesson. There must always be the evaluation as you use the materials. Did the materials I selected do the job? Well, you want to have the tools in hand. I am not going to give you the ax now, but I am going to try to drive home the point. And this is what you can do with any or all of these audio visual materials. They're going to help you do the job you want to do.	Hook and Loop Board AX ON HOOK AND LOOP BOARD

UNIT	SUMMARY OF FILM PRESENTATION
8	DEVELOPING INSTRUCTIONAL AIDS

In this present unit, Unit 7, you have been introduced to many of the audio visual pieces of equipment which your instructor felt were of most importance in the teaching-learning process. In a majority of instances, this equipment is available in the vocational-technical and should be utilized. In this seventh unit, your instructor has attempted to show you what these devices are and how you may use them effectively to improve communications.

The next unit will deal with the problem of developing certain special materials, particularly when you must build your own. While the general audio visual materials are rich and numerous, the peculiar special things which are unique to almost every teaching area often must be made up by the teacher.

Therefore, Unit 8 will deal with an overview of the problem plus illustrations of equipment and materials in use.

Unit 8 - Summary Review

I. Review Major Points from Unit 7

II. Analyze the Teaching Situation
  A. Who is the audience?
  B. What needs to be put across to them?
  C. Why is material important?
  D. How can it be delivered most effectively?
  E. How can you make this delivery most concrete to audience?

III. Identify Available Resources
  A. The audio visual coordinator
  B. Educational Media Index
  C. Government Film Catalogue
  D. University of Minnesota Educational Film Catalogue
  E. Buyer's Guide of Visual Products
  F. Educational Screen, Audio Visual Guide
  G. Business Screen
  H. Training in business and industry

IV. Commercial Materials for Use
  A. Thermographic material
  B. Diazo
  C. Colored pens
  D. Color film and transparencies
  E. 35mm cameras

V. Equipment and Uses
  A. Projectors
    1. opaque
    2. filmstrip
  B. Tape recorder

VI. Importance of Communications

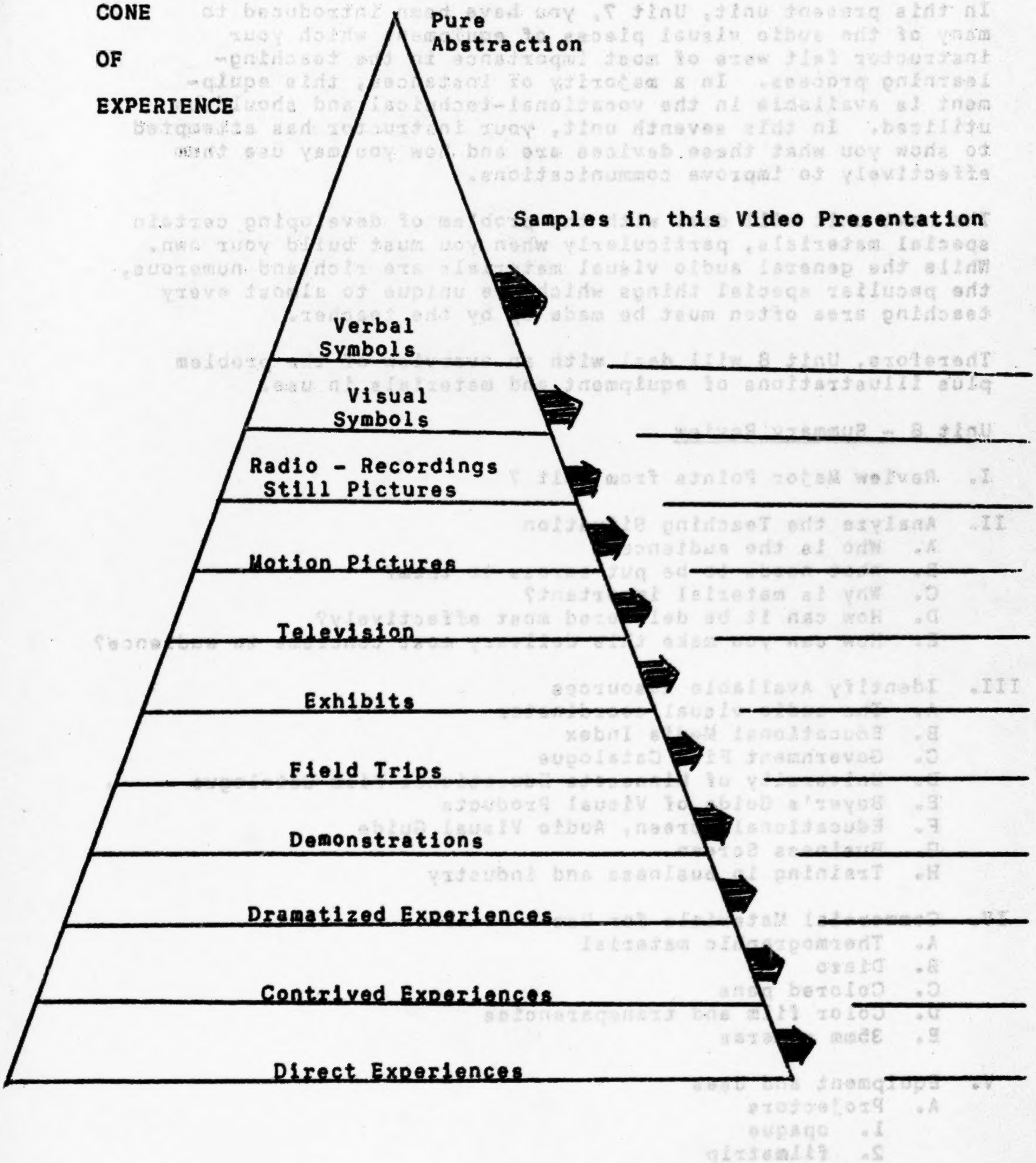
Appendix F Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	CONE OF EXPERIENCE
7	TEACHING WITH INSTRUCTIONAL AIDS

CONE

OF

EXPERIENCE


Pure Abstraction
Samples in this Video Presentation
Verbal Symbols
Visual Symbols
Radio - Recordings Still Pictures
Motion Pictures
Television
Exhibits
Field Trips
Demonstrations
Dramatized Experiences
Contrived Experiences
Direct Experiences

UNIT	STUDENT ACTIVITY SHEET
7	TEACHING WITH INSTRUCTIONAL AIDS

1. **On the previous page entitled Cone of Experience, list as many examples as you can which illustrate well each level of the Cone. Many of these illustrations can be drawn directly from the film presentation.**

2. **Since you are not yet associated with a vocational school, assume that you will have a job soon. List the audio-visual equipment which you would want available to you and why you would want that specific equipment.**

Equipment	Why You Want the Equipment or How You Would Use It

UNIT	TEACHER REFERENCES
7	TEACHING WITH INSTRUCTIONAL AIDS

References:

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E. Minor, Ed., Preparing Visual Instructional Materials, New York, N.Y., McGraw-Hill, 1962.

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G. Wittich, W. and Schuller, C., Audio Visual Materials: Their Nature and Use, New York, N.Y., Harper and Brothers, 1962.

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I. ________________, Educational Media Index, McGraw Hill, New York, 1964.

Unit 8

Developing Instructional Aids

TEACHER'S GUIDE

FOR

DEVELOPING INSTRUCTIONAL AIDS | UNIT 8

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining filmed presentations and seminar discussions designed to provide twenty-four clock hours of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 8 INTRODUCTION

The study of the development of instructional aids in this unit is a continuation of audio-visual aids started in Unit 7. Where the intent of the preceding unit was that of media selection and use for a teaching objective, the aim in this unit is centered in development methods, processes, and sources. A considerable part of the unit is devoted to the common indexes, catalogues, and other resource publications.

It should be remembered as for all units of this course that the treatment of the subject presented here is only an overview and introduction for first teaching responsibilities. For complete certification for most vocational schools, the subject is given in a full course for twenty-four clock hours.

UNIT 8 | OBJECTIVES

A student achieving the broad objectives for this course as clarified for this unit should:

(1) Know the common indexes, catalogues, and basic audio-visual materials sources.
(2) Understand common audio-visual materials and processes.
(3) Understand the characteristics of common audio-visual equipment.

The specific objectives (content) for attainment in this unit are:

STUDENTS WILL UNDERSTAND: cognitive principles, generalizations, concepts

1. Review Cone of Experience
   - A. Spoken word - top
   - B. Concrete exchange of ideas -bottom
   - C. Bottom of cone - finest words
2. Audio Visual Directors, Coordinators
   - A. Trained
   - B. Know available materials
   - C. Know available equipment
   - D. Know materials sources, indexes, catalogues, etc.
3. Audio Visual Sources
   - A. Educational media index
   - B. Government film catalogue
   - C. University of Minnesota film catalogue
   - D. Buyer's Guide - Visual products
   - E. Educational screen
   - F. Audio-visual guide
   - G. Business screen
   - H. Training in business and industry
4. Overhead Projection
   - A. Prepared transparencies
   - B. Writing transparency roll
   - C. Special transparent devices
5. Transparency production
   - A. Thermographic
   - B. Diazo
   - C. Printed-lettered-photographed
   - D. Modification of machine printed
6. 35mm Transparencies
   - A. Color
   - B. Magnification
   - C. Reduction
   - D. Sequence
   - E. Commercial
   - F. Teacher produced
7. Transparency Projectors
   - A. 35mm slides
   - B. 35mm strip film

UNIT 8 | LESSON MATERIALS

The following teaching materials to help you with the teaching of this unit are included in the appendix to this unit. You will want to duplicate the number of necessary copies to use as you lead the seminar discussion.

Material

A. The thirty-minute film, "Developing Instructional Aids", may be obtained from the Director, Vocational Section, State Department of Education, Centennial Building, St. Paul, Minnesota 55101.

B. Script of Film, Developing Instructional Aids

C. "Summary of Film Presentation"

D. Unit 8 Examination

E. Unit 8 Examination Answer Sheet

F. Unit 8 Examination Key

G. Unit References

UNIT 8 | SUGGESTED METHOD OF APPROACH*

DISCUSSION LEADER	STUDENT ACTIVITY
1. Introduce unit with "Summary of Film Presentation" hand-out sheet (Sample for duplication in the unit appendix). Advise students that this summary eliminates the need to take notes during the film viewing and that it can also be used later as review material.	1. Review the summary sheet.
2. Arrange for film viewing either individually or in groups.	2. View film for Unit 8, "Developing Instructional Aids".
3. Give Unit 8 test. (Samples for duplication in the unit appendix). Advise students to mark only the answer sheet so that test forms can be used again.	3. Complete test answer sheet (no time limit).
4. Provide test answers.	4. Correct answer sheet.
5. Initiate discussion from student test responses.	5. Return answer sheets to instructor.
6. Review methods of: (1) communication, (2) media selection, (3) developing instructional aids, and (4) effective utilization of audio-visual resources	
7. Inform students of audio-visual facilities available in your school.	

*The same approach can be used for one student or a group of students. While this approach is a suggested one, it is suggested also that the teacher for whom this content is new follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 8 | **SUGGESTED METHOD OF APPROACH**

DISCUSSION LEADER	STUDENT ACTIVITY
8. Discuss procedures in obtaining audio-visual equipment, materials, and professional help in your school.	
9. Have students list sources other than those mentioned in film presentation in acquiring audio-visual aids.	
10. Hand out "Graphics Source List" (see appendix).	
11. Introduce next source unit and hand out copies of, "Summary of Film Presentation" for Unit 9.	

UNIT 8	UNIT RESOURCE APPENDIX DEVELOPING INSTRUCTIONAL MATERIALS

RESOURCE MATERIAL

A. Unit Test

B. Unit Test Answer Sheet

C. Unit Test Answer Key

D. Film Script

E. Hand-Out Film Summary

F. Graphics Source List

G. Teacher References

UNIT	UNIT EXAMINATION
8	DEVELOPING INSTRUCTIONAL AIDS

Directions: This examination is designed to evaluate your learning for the formal video or film presentation part of this unit of study. Answer each item by darkening the appropriate letter of your choice on the answer sheet. All answers should be recorded only on the answer sheet. Do not make any marks on this test form.

1. The hatchet was placed on the presentation board to:
   A. Get attention
   B. Show contrast
   C. Demonstrate the felt board
   D. Demonstrate a magnetic board

2. In deciding between a film strip, motion picture or transparency set, it would be best to make selection in terms of:
   A. Ease of acquisition of the materials
   B. Objective to be attained
   C. Projectors available in your school
   D. Amount of color and material in the materials

3. Where cost of material is the major factor you would probably select:
   A. The overhead projector
   B. The 8mm motion picture projector
   C. The 2 x 2 slide projector
   D. The opaque projector

4. Where there is little or no facility for room darkening, you could best use:
   A. The overhead projector
   B. The opaque projector
   C. The 8mm motion picture projector
   D. The 2 x 2 slide projector

5. Where local material would be essential you would probably find the ________ most desirable:
   A. Overhead projector
   B. The opaque projector
   C. 2 x 2 slide projector
   D. The film strip projector

6. Where motion is essential but the relatively simple subject is not widely taught you would probably select:
   A. 8mm
   B. 16mm
   C. 35mm
   D. 70mm

UNIT	UNIT EXAMINATION (CONT'D)
8	DEVELOPING INSTRUCTIONAL AIDS

7. Where motion is essential and a dramatic or historic event is to be studies you would probably select:
   A. 8mm
   B. 16mm
   C. 35mm
   D. 70mm

8. The teacher wants to show the working of the button hole attachment on the sewing machine. She has 40 students in the class. Likely she would choose to use:
   A. Film strip
   B. 16mm motion picture
   C. Opaque projection
   D. Closed circuit television

9. The teacher wishes to personally add changes to the picture on the screen. He would probably use:
   A. 16mm
   B. Opaque
   C. Overhead
   D. Film strip

10. A transparency for the overhead of a graph in the evening paper would most likely be made:
    A. By hand
    B. By diazo process
    C. By the pantograph
    D. By the thermographic process

11. The AV Director should not be expected to:
    A. Provide equipment
    B. Make transparencies
    C. Supply help in making bulletin boards
    D. Decide what type of teaching materials you will use

12. The development or production of diazo material utilizes:
    A. B and C
    B. Ammonia
    C. Exposure to a light source
    D. All of the above

13. The process of producing transparencies which utilized a heat sensitive film was:
    A. Graflex method
    B. Diazo method
    C. Photo reflex method
    D. Thermo fax method

UNIT	UNIT EXAMINATION (CONT'D)
8	DEVELOPING INSTRUCTIONAL AIDS

14. The 35mm slide of the pencil points illustrated:
    A. Pictures that were reduced
    B. Small copy photography
    C. Large copy photography
    D. 2 x 2 slides are impractical

15. The instructor's philosophy relating to the use of AV materials was stated:
    A. Use only commercial materials
    B. Rely on your own ability to make AV materials
    C. Dare to experiment with AV materials
    D. Never use any materials which have not been thoroughly tested

16. A source where you would find all available audio visual materials on a given subject would be:
    A. Readers Guide to Periodic Literature
    B. Educators Media Index
    C. Willsons Guide
    D. EFLA Film Evaluations

17. The largest source of educational films in Minnesota is:
    A. Your own school film library
    B. The University of Minnesota Extension Film Library
    C. General Motors Film Library
    D. Minneapolis Public Library

18. For the preparation of your own photographic slides and copies you would find the ___________ most valuable.
    A. Polaroid camera
    B. Single lens reflex camera
    C. Stereo type slide camera
    D. 8mm still camera

19. The instructor did not stress the:
    A. Right attitude towards audio visual materials
    B. The knowledge of resources available to you
    C. The skills you should have in equipment operation
    D. The artistic abilities necessary for preparation of charts and graphs

20. The instructor stated that materials carefully selected, properly used and thoroughly discussed would:
    A. Leave the student with specific facts
    B. Give the student more take home learning
    C. Increase the vocabulary of the student
    D. Give the student verbal facility

Appendix B Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER SHEET - UNIT EXAMINATION
8	DEVELOPING INSTRUCTIONAL AIDS

Name **Code No.**
Date **Score**
Discussion Leader

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

Before you begin the examination or while you are waiting for others to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

Appendix C

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER KEY - UNIT EXAMINATION
8	DEVELOPING INSTRUCTIONAL AIDS

Name ____________________
Date ____________________
Discussion Leader ____________________

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	●	○	○	○
2.	○	●	○	○
3.	○	○	○	●
4.	●	○	○	○
5.	○	○	●	○
6.	●	○	○	○
7.	○	●	○	○
8.	○	○	○	●
9.	○	○	●	○
10.	○	○	○	●
11.	○	●	○	○
12.	●	○	○	○
13.	○	○	○	●
14.	○	●	○	○
15.	○	○	●	○
16.	○	●	○	○
17.	○	●	○	○
18.	○	●	○	○
19.	○	○	○	●
20.	○	●	○	○

INSTRUCTOR NOTES

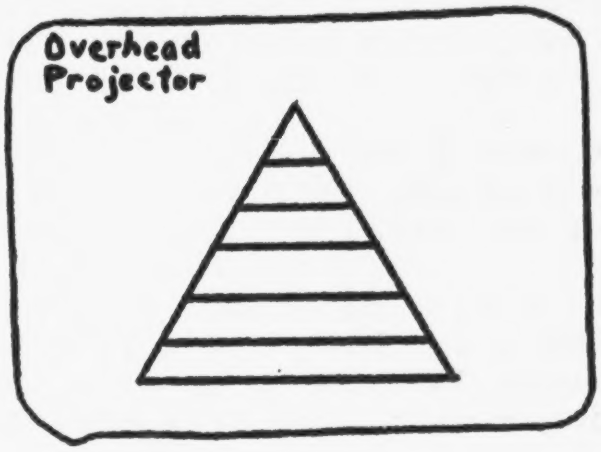
Appendix D

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

FILM SCRIPT	DR. NEVILLE PEARSON
UNIT 8	DEVELOPING INSTRUCTIONAL AIDS

AUDIO	VIDEO
Good evening. Welcome again to Introduction to Vocational-Technical Teaching and a continuation of the audio-visual units of this course. Last week I used my hatchet to drive home a point; it's still on the board where we left it. Audio visual materials will help you do the same thing and will make it possible for you to provide your students with more take home learning.	Felt Board MORE TAKE-HOME LEARNING
But, let's continue where we stopped last week. Let's think of these particular questions as we begin our discussion this evening. What am I saying? What is my audience? To whom? And why is this material important? How can it be said in a most effective way?	Overhead Projector WHAT AM I SAYING? TO WHOM? WHY? HOW CAN IT BE SAID MOST EFFECTIVELY?
To start with, I was using the hook and look material which held the hatchet on the board. We can use this sort of material for a variety of presentations. And it is going to be an attention-getting device. When you put something like the heavy weight hatchet on the board, certainly your audience is going to notice. As you plan to use the hook and loop board or other materials in your classes, one of the most important things for you to check on is the various resources that are available to you. In practically all of the schools in the state of Minnesota we're going to find audio visual directors. They are going to be able to help you do a job of using visuals in your classes. These audio visual directors are trained; they know the materials that are available; they know the equipment that is available; they keep up-to-date on new things as they come along. They will help you interpret the cone of experience that we	Overhead Projector KNOW YOUR RESOURSES

FILM SCRIPT	DEVELOPING INSTRUCTIONAL AIDS
UNIT 8	PAGE 2

AUDIO	VIDEO
introduced you to last time. Remember that Dr. Dale has placed the spoken word at the top of the cone. It's a convenient, abstract symbol for direct, purposeful experience - a concrete exchange of ideas at the bottom of the cone. In between we have the various steps, the various communication channels that we can use for the transmission of ideas, the sharing of information with our students. You want to always remember that you're going to get as close to the bottom of the cone as you can and stay away from using words that the students are not going to understand until they have had some basis for understanding, appreciating those particular words.	
Now, the audio visual coordinator can help you to do many things, but it's practical for you to obtain your own resources. One of these would be a basic catalogue of information. This is the Educational Media Index - Volume for Industrial Arts Technical Training, Vocational Training. Within this volume you're going to find listed almost all of the films, filmstrips, slide sets, overhead transparencies, tape recordings, video tapes that are available in this particular field. This is one of fourtenn volumes in the total educational media index. It's going to be a set of books that you will find in the office of your audio visual director. It is one that you should be acquainted with. Look to this sort of index frequently for tips on material that you should consider using in your classes. Then there are other sources such as the Government Film Catalogue for public educational use. This contains a wide variety of materials that the United States government is making available.	ALL UNDERLINED RESOURCE PUBLICATIONS SHOWN BY DR. PEARSON
Here in Minnesota we would call your	CONT. NEXT PAGE

AUDIO

attention to the University of Minnesota Educational Film Catalogue, published by the Extension Film Library, and brought up-to-date every year with their supplements; even more frequently with their monthly Look, Listen, and Learn Bulletins. This can come direct to your desk as well as to the desk of your audio visual director.

In your own school system you're going to have sources; this is the one from the St. Paul schools, and a very good catalogue of materials that are found in this public school library.

All of our schools throughout the state don't have their own film libraries, but many are starting them. And with federal assistance available, there will be funds for technical, industrial films as well as other subjects.

Know the producers of these materials. Coronet Films, Jan Handy - particularly in film strips - Encyclopedia Britannica; here is the Buyers Guide to Visual Products from the Minnesota Mining people. Know some of the periodicals in the audio visual field as well as in the industrial arts technical-vocational field. Audio visual instruction is going to present many articles that will be of interest to you, techniques for using these materials, new materials on the market. Educational Screen, Audio Visual Guide is another one of these find, general publications in the audio visual field. Business Screen, as the title would imply, will give you information on what business is doing in the use of audio visual materials. Many of the films produced by business and industry can be brought right into your classrooms to help you do a better job.

Training in Business and Industry; this particular edition has an article on

VIDEO

UNDERLINED RESOURCE PUBLICATIONS DISPLAYED BY DR. PEARSON.

AUDIO

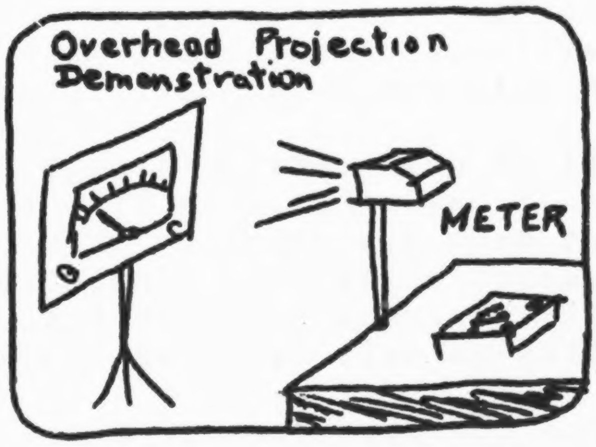
"Closed Circuit Television", "Are you Ready for Closed Circuit Television", "Training at Volkswagon", "Programmed Instruction - What Makes it Tick." All articles pertaining to the use of audio visual instructional materials.

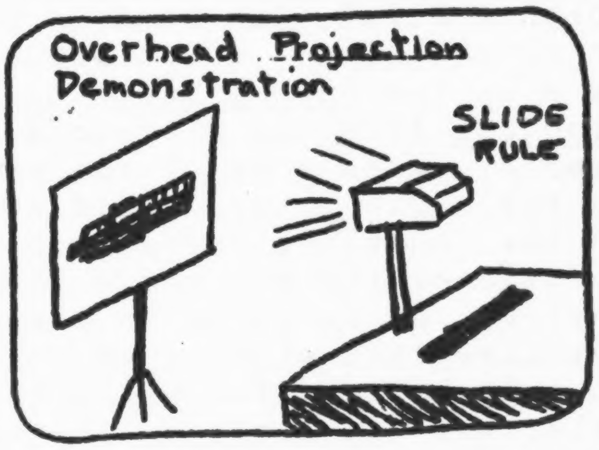
Reproduction methods for business and industry; again another one of these sources is finally industrial photography. Learn to know all of these sources of help for you, and plan to use the resources that are available within your own school.

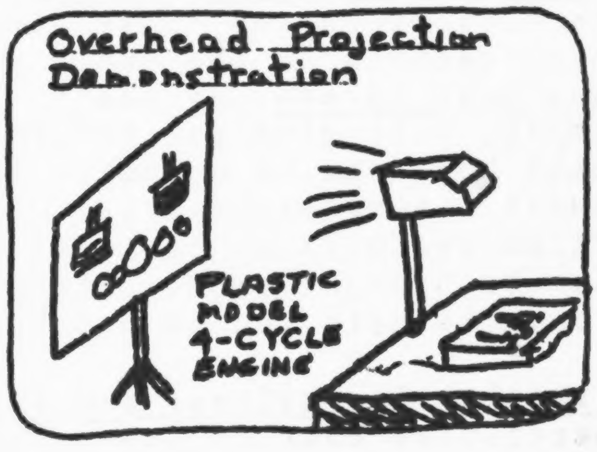
Now, the commercial materials that these people produce are available in a variety of ways. We might have materials for the overhead projector such as this meter which would be useful in different courses that you folks would be teaching. Maybe you're going to be interested in using the slide rule on the stage of your overhead projector. More probably you're going to be interested in making some of your own materials; and from packets such as I showed you last week, you can select a variety of masters that can be prepared in very short order. Let me take one from this original set on combustion engines. Let me take a sheet of the thermographic material and jog them together. I see that the notch is in the upper right hand corner of the sheet. Then, I'm going to insert this in the thermo fax machine and automatically it goes in, and in approximately four seconds we have completed the transparency that we now see on the screen. We could use this particular transparency; there are many others in this immediate set.

We might go on to use the working model of the four cycle engine, and we could use a little crank to talk about the

VIDEO






Overhead Projection Demonstration
PLASTIC MODEL 4-CYCLE ENGINE

AUDIO	VIDEO
intake, the compression, the power, and the exhaust stroke. This sort of commercial material, along with the materials that you can make in from your students or just before you come to class, the sort of materials that you can modify in a course, if practical, for you to make your own materials. Here is one where we have used a felt pen, use some colored pens to provide a color that most of you on television are not seeing. But the transparency was prepared very quickly, very easily in a matter of moments. Where color is desirable we could use another type of material that would be easy for you to obtain in your shops. You are going to find blue printing equipment in many of your shops, and with the easel type transparency material, it's a simple matter to take your masters, run them through the printer, and come out with, oh, red, violet, green, black, blue, brown, sepia - all sorts of colors. I am going to ask my associate, Mr. Abrahamson, to do the job of printing the master, of putting the transleucent master into the light source which is just a modification of the blue print equipment that you find in your shops. Dave is being careful to see that the master, which is transleucent and has opaque lettering on it spelling out diesel, is going to be towards the light source. We have the notch in the upper right hand corner of the light sensitive film. This film is not sensitive to ordinary incadescence or fluorescent light; it does require a rather long exposure. Well now, the print has been made; he's putting it into the developing chamber, and he's going to inject some strong ammonia, ammonium hydroxide. And in just a matter of moments, the print, black letters on a clear screen or it could be red or blue or green or any color that we have elected, are	

AUDIO	VIDEO

going to start popping into view. This process is a little more complex, complicated than the thermographic process, but it is something that does work quickly and easily and with a little experience of your part, a little experimentation, we can get the finished print and put it on the screen. Again, you can modify this material with your pens, you could have overlays, you can have all of the color that is inherent in the material, color that we can't show you on television this evening.

If you want to go further into color, then I would suggest that you use your 35mm camera. This is your single lense-type camera that makes it possible for you to do a variety of jobs photographically. You can, of course, record all sorts of material that you can pose in your shop. You're going to visit different places; you can record so very much material with this 35mm camera.

You can also use this to copy, and in copying you can reduce large size materials. You can enlarge small materials. Let's look at some 35mm slides here of a safety chart, a rather large size, not particularly convenient always to carry around from classroom to classroom. Not always particularly handy to store. Once you have photographed it on 35mm film, it takes up only a very small amount of space. You can enlarge it to any size so that it is going to be big enough for the very largest audience to see.

Let's consider some of the other sorts of materials that you can copy and reduce. Or then we can go on to enlarged materials. Maybe you don't recognize the Model A car that you can

AUDIO	VIDEO
see on the screen. This is the car along side of the Treasury Building on the reverse side of a ten dollor bill. But, next time you have one of these ten dollar bills, look at the car and you'll have some idea of the amount of magnification that has been possible with the 35mm camera getting in very, very close to the original material. Perhaps more practical for you would be something like this. If you're going to try to show your students the sort of points that they should have on their pencils, you can actually move in very close - you see the measuring rule there that indicates the size of the lead, the type of point that you might want your students to have on their pencils. Here is a resister, and you know the usual size enlarged, the color bands show up so that you can have the students learn to read them from the screen. All of these materials are quickly, easily recorded with your 35mm camera. As I said last week, it is one of the most valuable tools that I can bring to your attention. It's going to make it possible for you to build up your own tailor-made sets of instructional materials, sets of materials that particularly fit the needs of you, your students, and your school. Now, if you don't want to do any photography, you might consider using commercial pictures that would be available in magazines, advertising materials, and you could so nicely prepare a set of materials for the overhead projector. This is the simple little cartridge that we have made (and these you could duplicate in your own shop). They are just a little heavy board box that is holding the picture material and this teacher has prepared a set of pictures on roots and vines of coated abrasives. Very	

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quickly we can remove the first picture, go on to the second one, which is the actual sandpaper, we can go on to the third one which is __________ material, and so on through all of the materials that are in the set. This is just one of the types of projects, units that you could build up.

Here's another example on various kinds of drafting equipment. The teacher has these ready in the file to pull out and use any time in the opaque projector. Now the opaque is, as I said last week, a rather large, clumsy piece of equipment, but it does the job without any special material except pictures, newspaper materials, advertising; this sort of thing that is so readily available. It does require a very well-darkened room. Your shops may not have this facility. If that is the case, then take these pictures, put them on 35mm film with your 35mm camera, and you don't have to worry quite as much about the darkening problem.

May I again review some of the other projectors that are available to you. Last week I tried to stress the fact that you must have skill in operating this equipment. For most of you shop people, this isn't going to be difficult to obtain. But just as with the tools in the shop, you have to practice, you have to have a perfected presentation. You do have to know what sort of material is available for your film strip projectory. Here is a very small model that could be used in group instruction, small group instruction, or for individual reviewing of film strips.

Here is another model that has a phonograph built right in. And, of course, the sound would accompany the filmstrip, the skilled narrator; it

AUDIO	VIDEO
might have more authority with your own narration. But, it's up to you to decide whether you want to do the narrating or to use the commercial narrations.	
Here is another model of a filmstrip projector that has a push button control so that you can move your filmstrip forward at the speed that you select. It is completely at your command. And it is a convenience item because you can be up in the front of the classroom talking to the class and still controlling the advance of the of the projector.	
Tools that you must know how to use and use them professionally. We talked very briefly about the 16mm projector. This is another one of the tools that is, of course, the backbone of any audio visual education program. The Education Media Index, the Film Library for the University of Minnesota, these other libraries that you may tap will mostly provide materials for the 16mm projector. And you want to think of the things that the motion picture can do.	
Things that are too big to bring into the classroom, things that are too small to be seen by the students, things that couldn't be seen at all can be shown be animation, things that move too rapidly that can be slowed down by slow motion photography, things that are too slow to be observed can be speeded up by time-lapse photography. Each of these various tools will serve a purpose in your classroom. As a teacher you must be acquainted with every one of these tools. You must know how to use them, you must know how to use them in a perfected way so that you don't have trouble focusing the projector, so that you don't	

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have trouble providing the volume of sound that is desirable.

I mention the next piece of equipment that we have here, the tape recorder. This simple little tool can capture sounds, store it for use for later at a more convenient time. You can capture the sound of the narration of the film or the filmstrip. You can capture the sound of your own presentation, and it is so practical to evaluate yourself from time to time by simply recording what it is that you are saying, so that you can listen without any supervisor present. Just improve yourself through the medium of stored sound on your tape.

Always as you select these materials you want to ask this question: Does it make a unique contribution? Does the film you have selected to something that could not be done better in some other way? The motion picture has so many, many possibilities. Your filmstrip has a variety of possibilities. You must always evaluate these materials. You have to preview them, you have to select them and then put them to use in the class. And even as this is done, you want to remember that they may appear to be worthwhile materials ahead of time and not quite do the job in the classroom.

Always remember that learning, teaching, education is communication. It's up to you to select the communication channel that is going to give the student just as much take home learning as possible. And always you have to see that you do give the student a completely clear picture; something that is going to make it possible for him to understand the spoken word, the printed woad, the abstract symbols that we must of necessity use most of the time. If you give your students a clear picture, if you show them what it is that you say. If you use a

AUDIO	VIDEO

variety of cross-media, multi-media, this multi-channel approach as you do the job teaching in your classroom, you are going to be a successful instructor.

You must always remember to define your objectives. What is it that I am trying to do? Then you are going to have to tailor your materials to the job at hand, to the particular class, and do keep in mind that the class you have this year might well be different from the class you had last year or the class that you're going to have next year. So, select transparencies, sometimes films, on other occasions, but select materials that do the job. And select materials that challenge the students. You want to always throw out a challenge so that they are reaching, so that they do want to learn, and you're going to do this most effectively by using integrated sight and sound materials. If you select from the variety of tools that we have tried to cover in these two short periods, if you keep in mind always that you can put yourself in the place of the student, the communication is going to be effective.

One quick review. Do know your resources. The things that your audio visual director in your school can help you to use. The things in your community that are available for you to use. Develop skills in the use of all of these materials, all of these tools. And please dare to experiment. Try something that is different. Don't fall into the rut of doing something just the same way that it was done last year or the year before that. Come up with something that is new. Then you will find that these audio visual tools, these power tools are going to be the sort of materials that will help you

AUDIO	VIDEO
put your message across. There is so much that has been left unsaid because of time limitations. If you're interested in further work, I invite you to come to the Audio Visual Laboratory at the University of Minnesota.	

UNIT	SUMMARY OF FILM PRESENTATION
9	EVALUATING INSTRUCTIONAL OUTCOMES

This summary of Unit 9 is planned for student use before viewing the film presentation. In addition to a preview, the outline can also serve as review notes for this unit. The information outlined in blocks below is a duplicate of the visual materials shown during the video presentation.

Unit 9 - Summary and Review

I. Nature and Conditions of Evaluation

A. A process of data gathering

1. We constantly collect or attend to information and conditions around us for the purpose of evaluating things, people, ideas, etc.
2. The things we know about are the things about which we are most competent to identify important criteria (bases for evaluating ---"What makes a 'good' chair good?").
3. Sound criteria allow us to ask the right questions and thus gather important information.

B. A process of weighing data

1. Which pieces of information are most important in general.
2. Which information answers our criterion questions best.

C. A guide to action

1. On the basis of evaluation results, one may:

   a. describe a person, place, or thing.
   b. diagnose what is wrong (or right) about a person, place, or thing.
   c. predict what may be expected to occur next concerning a person, place, or thing.

D. Evaluations may be based on measurements or judgements or both.

1. Measurements tend to be exact and do not depend on who does the measuring.
2. Judgements are subjective and depend, for their usefulness, on who does the judging. Everyone has opinions but only those who know the subject have opinions (judgements) of dependable value.
3. Generally, the more measurement involved rather than judgement the more dependable are the results of our evaluation.

Measurement		Judgement
	Is it visually pleasing?	x
x	Is it comfortable?	x
x	Is it strong enough? (Will it hold 600 lbs?)	

UNIT	SUMMARY OF FILM PRESENTATION
9	EVALUATING INSTRUCTIONAL OUTCOMES

Evaluation is a constant and very important part of the teacher's role. Evaluation is an aid to instruction.

II. Factors Involved in the Evaluation Process

Evaluation

Measurement ---- Judgement
Functions
Information
Techniques & Instruments
Evaluator's Competence
Criteria

A. Functions - for what purposes do we use evaluations?

1. In general, evaluations are used to describe, diagnose, and predict.
2. Many functions of evaluation may be identified; some important ones are to check:

   a. student achievement
   b. instructor's effectiveness
   c. learning difficulties of the student
   d. qualifications of students

3. Evaluation processes may be used as a:

   a. teaching method
   b. guide to planning instructions

B. Information - what do we need to find out about the problem?

C. Techniques and Instruments - how do we gather the desired information?

D. Evaluator's Competence - does the evaluator know enough about the problem to ask the right questions?

1. The evaluator needs to know about the subject udder evaluation, and
2. he needs to know about the process of evaluation.

E. Criteria - what are the signs or conditions which best indicate or describe a problem?

1. If the function of a particular evaluation is to describe a student's level of achievement, then what are the criteria which best describe high achievement, average achievement, or low achievement?

UNIT	SUMMARY OF FILM PRESENTATION
9	EVALUATING INSTRUCTIONAL OUTCOMES

2. The clearer we make our criteria, the easier it is to select proper instruments or techniques for gathering information.

III. The Context of Evaluation

A. School Plant - the site in which instruction occurs.

1. The plant is susceptible to evaluation (how well does it contribute to good instruction), and
2. It, to some degree, controls the functions to be serves and techniques used.

B. School Program - the organization of the school day and course content.

1. This should be a constant area to be evaluated.

C. The Teacher - in large, the beginning and end of the evaluation process.

1. The teacher needs to be effective in the application of evaluation, and
2. Must be responsive to the results of evaluation.

D. The Student - the essential reason for educational evaluation.

1. In effective educational programs, the student nedds to be subjected to evaluation before entry, during attendance, and after graduation.
2. The student is the focus of all the functions of evaluation.

IV. Expansion of Selected Factors

A. Six functions

Functions of Evaluation
Student achievement
Instructor's effectiveness
Learning difficulties
Teaching device
Student selection
Guide to planning instruction

1. Student achievement

   a. most common function
   b. great variety of methods used

2. Instructor's effectiveness

   a. need to check results of teaching method
   b. organization of content

UNIT	SUMMARY OF FILM PRESENTATION
9	EVALUATING INSTRUCTIONAL OUTCOMES

3. Learning difficulties

    a. what are reasons for a student's failure to achieve?
    b. are some remedial conditions suggested through evaluation?

4. Teaching device

    a. increases motivation of students
    b. concentrates attention
    c. helps identify and immediately correct errors

5. Student selection

    a. saves students' time and effort
    b. helps conserve educational resources

6. Guide to planning instruction

    a. evaluation techniques help identify content which needs more emphasis
    b. helps identify trouble spots in method
    c. helps describe the nature of the learners

B. Techniques and Instruments - some conditions to be satisfied

Techniques and Instruments

Is it valid?
Is it reliable?
Are scoring procedures consistent?
Is it administratively sound?

1. Validity - does the evaluation instrument really test what we think it tests?

    a. a student can sometimes tell how to do but cannot do in fact.
    b. it may be necessary, for economics sake, to accept a margin of error in the results of evaluation.

2. Reliability - does the evaluation instrument consistantly measure what the student knows or do his answers change from time to time?

    a. questions sometimes change their meaning to students because of the way they are stated.
    b. we may ask for partial answers, several of which may be correct, but which do satisfy our criteria.

3. Consistant Scoring - does the same answer get the same amount of credit no matter who scores it or when it is scored?

UNIT	SUMMARY OF FILM PRESENTATION
9	EVALUATING INSTRUCTIONAL OUTCOMES

a. is there one correct answer or response?
b. does correctiveness depend largely on individual judgements?

4. Administrative Soundness - is the evaluation technique worth using or must we put too much time, effort, and/or money into it?

a. some techniques may demand so much time that other important factors must be ignored.
b. are there other techniques which will serve our needs within reason which "cost" less?

Task: ____

	Performance Description
Validity	
Reliability	
Scoring Consistancy	
Administrative Ease	

UNIT 8 GRAPHICS SOURCE LIST

Mounting Materials

Dry Mounting

Equipment:

Seal Dry Mounting Press (3-6)* (Tacking iron included)	$58.00 to $350.00
Paper Trimmer 15" x 15" (1)	$21.45
Lasco Corner Rounder #20 (3)	$24.00

Supplies:

Kodak Dry Mounting Tissue 150 sheets/box 8" x 10" (3)	$4.10
Six Ply Beveridge Placard Blank 22" x 28" (2)	$.08/sheet
Fourteen Ply Poster Board 28" x 44" (2) (Available in yellow, blue, red, lavender, green, shellrose, and white).	$.55/sheet

Rubber Cement Mounting

Supplies:

Best-Test Rubber Cement 1 gal. (1)	$3.95
Best-Test Rubber Cement Thinner 1 qt. (1)	$.80
Six Ply Beveridge Placard Blank 22" x 28" (2)	$.08/sheet
Glass Rubber Cement Dispenser 16 oz. (1)	$1.95

Wet Mounting

Supplies:

Table top or smooth surface
Wheat flour paste
3" or 4" paint brush
Shallow pan
Unbleached muslin
Thumb tacks
Wooden rolling pin
(Above materials are to be obtained locally.)

Three Dimensional Bulletin Board Materials

Supplies:

Plasti-tak (1)	$.25 & $1.00
Holdit 5 oz. (5)	$.98

UNIT 8 | GRAPHICS SOURCE LIST

Sources - Mounting

1. Artsign Materials Co.
404 Marquette Ave.
Minneapolis 1, Minn.

2. Carpenter Paper Co.
3245 Hiawatha Ave.
Minneapolis, Minn.

3. Century Camera Inc.
26 South Seventh St.
Minneapolis 1, Minn.

4. Craftint Mfg. Co.
1615 Collamer Ave.
Cleveland 10, Ohio

5. St. Paul Book & Stationery Co.
Sixth and Cedar
St. Paul, Minnesota

6. Seal Inc.
8 Broad St.
Shelton, Conn.

Lettering Materials

LeRoy Lettering (12-13)

LeRoy Scriber #3237-1	$4.75
LeRoy Scriber #3237-4	$9.00
LeRoy Standard Pens 1 each	
#1	$1.25
#3, 5, 7	$.85
#9, 12	$1.40
LeRoy Template	
#140C 1/8"	$5.25
#200C 3/16"	$5.75
#425C 7/16"	$7.35
#1000C 1"	$10.00
#2000C 2"	$13.65

Wrico Lettering (16)

Education Set B	$10.00

Includes:
Guide MSC 100 1" Upper Case
Guide MSL 100 1" Lower Case
Guide MSN 100 1" Numbers
Pen, Guide Holder, India Ink, and Box

Cut Out Letters

Cardboard Cut Out: (10)

Mutual Aids 2" Caps (180 pieces) or 1 3/8" Manuscript (240 pieces) Red, black, green, yellow, blue, white	$1.25/set
Gold & Silver	$1.50/set
4" Caps and numbers (150 pieces)	$2.00/set
6 1/4" Caps (40 pieces) Red & black	$2.00/set
6 1/4" Numbers & signs (40 pieces)	$2.00/set

UNIT 8 | GRAPHICS SOURCE LIST

Gummed Back: (11)

Tablet & Ticket #PA1 Assortment (1600 characters) 3/4", 1", and 1 ½" in letters & numbers Black and white	$8.00

Adhesive Cut Out: (14)

Planotype Letters (Ozalid) 4 type faces, 10 sizes (5/32" to 1 1/2") 6 colors, opaque and transparent	$4.95/sheet

Cold Type: (7-9)

Artype - Letters, numbers, symbols, etc.	$1.00/sheet
Craftint - Letters, numbers, symbols	$1.00/sheet
Quillo - Letters, numbers	$1.15/sheet

Rubber Stamps (15)

Superior Rubber Stamp Kit #R1-984 1" Caps	$6.00
Superior Sign Marker #920 caps & l.c. 3/4"	$6.00

Sources - Lettering

7. Artsign Materials Co.
404 Marquette Ave.
Minneapolis, Minn.

8. Artype Incroporated
127 S. Northwest Highway
Barrington, Ill.

9. Craftint Mfg. Co.
1615 Collamar Ave.
Cleveland 10, Ohio

10. Mutual Aids
1946 Hillhurst Ave.
Los Angeles 27, Calif.

11. Tablet & Ticket Co.
1021 W. Adams St.
Chicago, Ill.

12. Keuffel and Esser Co.
520 S. Dearborn St.
Chicago, Ill.

13. Minneapolis Blue Printing
612 Third Ave. South
Minneapolis, Minn.

14. Osalid
Johnson City
New York

15. Horder's Inc.
231 S. Jefferson St.
Chicago 6, Ill.

16. Wrico Lettering
Wood-Regan Instrument Co.
Nutley, New Jersey

UNIT 8 | GRAPHICS SOURCE LIST

Gummed Paper (*)	
Adventure Gummer Paper assorted colors or packets of one color	Ideal Supply Co. Chicago 20, Ill.
Dennison Gummed Papers assorted colors	Dennison Manufacturing Co. Framingham, Mass.
Adventure Day-Glo flourescent colors; single colors or assorted	Ideal School Supply Co. Chicago 20, Ill.
Poster Paint	
Dolfinite Poster Color waterproof; covers well with one coat	Artsign Materials Co. 404 Marquette Ave. Minneapolis, Minn.
Upson Board	
Upson Board or Chippewa Board (3/16") or (1/8") for letters, cutouts, backgrounds, etc.	Local Lumber Supply
Steel Brush Pens	
Wide stroke pens using India ink; varying widths	C. Howard Hunt Pen Co. Camden 1, New Jersey
Instant Lettering	
Letraset (a dry transfer); many styles and colors; opaque and transparent	Local Art Supply
Matte Acetate	
Sheets or rolls; varying thickness (class used .005)	Local Art Supply
Matte Knife	
Stanley Knife No. 299; replacement blades in packages of 5	Stanley Tools New Britain, Conn.
	Local Hardware or Variety
Jig Saw	
Dremel Moto Shop; Senior or Junior size	Dremel Manufacturing Co. Racine, Wisconsin
	Hobby or Local Hardware

(*) School Supply Houses usually stock this item.

UNIT 8 | GRAPHICS SOURCE LIST

Mounting Cloth Chartex Dry Backing Cloth; apply with hot iron or in mounting press	Seal Inc. Shelton, Conn.
Hook and Loop Velcro; backgrounds in various colors; loop in strips with adhesive backing	Maharam Fabric Corp. 420 N. Orleans St. Chicago 10, Ill.
Flourescent Chalk Blak-Ray; this company also makes flourescent crayons, yarn, paper and paint	Ultra-Violet Products, Inc. South Pasadena, Calif.
Laminating Film Sealamin; in rolls or sheets	Seal Inc. Shelton, Conn.
Rubber Map Molds Heavy rubber molds of U.S., North America and South America	Art Chemical Products, Inc. Huntington, Indiana
Plastic Adhesive (*) Holdit; a reusable material similar to Plasti-tak	Eberhard Faber Co.
Hobby Crete A foundation material for Dioramas, Displays, Decorative floats, Puppets and Models	Minnesota Perlite Corp. 315 West 86th Street Minneapolis, Minn.
Felt Markers (*) Plymouth Quick Dry Marker; various colors	United States Pencil Co. 100 Fifth Ave. New York 11, N.Y.
Sanford's Felt Tip Marker; individual colors or in sets	Sanford's Bellwood, Illinois
Letters Webway; gummed backing, red black and white; several styles and sizes	Holes-Webway Co. St. Cloud, Minn.
Plaster-tile; various sizes and styles; with or without pins	Mitten Display Letters Redlands, Calif.
Stick-A-Letter; various sizes and colors; gummed paper	Stick-A-Letter Co. Rt. 2, Box 286 Escondido, Calif.
Plastic for Imbedding Castolite; clear plastic; also available in colors; comes in bulk and kits.	The Castolite Co. Woodstock, Illinois

UNIT	TEACHER REFERENCES
8	DEVELOPING INSTRUCTIONAL AIDS

References:

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D. Kemp, Jerrold E., Planning and Producing Audio Visual Materials, Chandler, San Francisco, 1963.

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I. ______________, Educational Media Index, McGraw Hill, New York, 1964.

Unit 9

Evaluating Instructional Outcomes

TEACHER'S GUIDE

FOR

EVALUATING INSTRUCTIONAL OUTCOMES	UNIT 9

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining
filmed presentations and seminar discussions
designed to provide twenty-four clock hours
of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 9 | INTRODUCTION

Unit 9, "Evaluating Instructional Outcomes", is the first of two units on evaluation. It is not intended as instruction in "how to" but rather "why to" evaluate. The rationale for and some of the qualifying conditions of evaluation are the content of this unit.

In general, participants in any class conducted via this content may be expected to have adequate experience with evaluation, as past students if not as instructors, to permit extensive and profitable clarifying discussion of concepts involved. Class member experience should be exploited, in discussion, as a means of examplification and vocabulary development.

The discussion leader will do well to avoid extended tangents concerning "how to" detail. At this point, as much time as possible should be given to broadening and clarifying the conceptual foundation for evaluation, in general, as a highly significant part of the overall educational endeavor.

UNIT 9 | OBJECTIVES

A student achieving the broad objectives for this course as clarified for this unit should:

(1) Understand and use, in context, the selected measurement terms used in the unit.
(2) Understand and apply, in context, the principles and intent of measurement activities as reflected in the unit.

The specific objectives for attainment in this unit are:

STUDENTS WILL UNDERSTAND: cognitive principles, theories, concepts

1. Evaluation as a Means to
   - A. Describe
   - B. Diagnose
   - C. Predict
2. Evaluation as a Process of
   - A. Data Collecting
   - B. Data Organizing
   - C. Data Weighing
   - D. Action Guiding
3. Distinction Between
   - A. Judgement
   - B. Measurement
4. Reasons for and Kinds of Criteria
   - A. As a Basis for Evaluation
   - B. Drawn from Course Objectives
   - C. Drawn from Job Analysis
5. Factors which Affect Evaluative Methods Used
   - A. Nature of the Criteria
   - B. Instructor's Knowledge and Skills
   - C. Personal Background of the Instructor
   - D. Economy in Time, Effort, and Cost
6. Functions of Evaluation
   - A. Student Achievement
   - B. Teacher's Effectiveness
   - C. Learning Difficulties
   - D. Teaching Device
   - E. Student Selection
   - F. Guide to Planning Instruction
7. Necessary Conditions for Evaluation
   - A. Validity
   - B. Reliability
   - C. Scoring Consistency
   - D. Administrative Ease

UNIT 9	LESSON MATERIALS

The following teaching materials to help you with the teaching of this unit are included in this resource appendix. You will want to duplicate the number of necessary copies to use as you lead the seminar-discussion.

Materials

A. The thirty-minute film, "Evaluating Instructional Outcomes", may be obtained from the Director, Vocational Section, State Department of Education, Centennial Building, St. Paul 55101.

B. Script of Film, Evaluating Instructional Outcomes

C. "Summary of Film Presentation"

D. Unit 9 Test

E. Unit 9 Test Answer Sheet (Keyed)

F. Unit 9 Test Answer Sheet - Student Form

G. Unit 9 References

UNIT 9 — SUGGESTED METHOD OF APPROACH*

DISCUSSION LEADER	STUDENT ACTIVITY
1. Introduce unit with "Summary of Film Presentation" hand-out sheet. (Sample for duplication in the unit appendix) Advise students that this summary eliminates the need to take notes during the film viewing and that it can also be used later as review material.	1. Study the summary sheet for the kinds of items summarized.
2. Arrange for film viewing either individually or for a group.	2. View film for Unit 9, "Analyzing for Instruction".
3. Give Unit 9 Test. (copies and answer sheets duplicated previously from sample in the unit appendix) Advise students to mark only the answer sheets so that test forms can be used again.	3. Complete test answer sheet (no time limit)
4. Provide test answers.	4. Correct answer sheet. Mark test score on progress chart by code number. Instructor will provide code numbers.
5. Initiate discussion from student test responses.	5. Return answer sheets to instructor.

*The same approach can be used for one student or a group of students. While this approach is a suggested one, it is suggested also that the teacher for whom this content is new follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 9 SUGGESTED METHOD OF APPROACH

Continued---

DISCUSSION LEADER	STUDENT ACTIVITY
6. Identify some sample behavioral objectives and suggest ways of evaluating each. Have class members list some examples of objectives and possible evaluative approaches in their area.	6. List two or three objectives and indicate the evaluation techniques which might be used with each.
7. Review the definitions of validity and reliability. Take student examples as per item 6 above and lead discussion about reliability and validity of samples selected.	7. Expand the samples selected and participate in the discussion.
8. Review definition of scoring consistency and administrative ease. Discuss relationship of these to student's examples.	8. Participate in discussion and suggest changes in samples that would better satisfy the qualifications..
9. Introduce Unit 10 and distribute "Summary of Film Presentation" for Unit 10.	

UNIT	UNIT RESOURCE APPENDIX
9	EVALUATING INSTRUCTIONAL OUTCOMES

RESOURCE MATERIAL

A. Unit Test

B. Unit Test Answer Sheet

C. Unit Test Answer Key

D. Film Script

E. Hand-Out Film Summary

F. Teacher References

G. Student Exercise Sheet

UNIT	UNIT EXAMINATION
9	EVALUATING INSTRUCTIONAL OUTCOMES

Directions: Select the one best alternative from among the four alternatives presented in each item. Darken the circle on the separate answer sheet corresponding to the alternative you have selected.

1. Evaluation may be described as essentially a process:
   A. used to increase the evaluator's effectiveness in attaining some goal.
   B. of identifying errors in student's understanding and/or performance.
   C. used to determine what a teacher needs to teach next.
   D. used to motivate students to pay attention to the important details in the course.

2. When we compare the judgement and measurement approaches to evaluation we realize that judgements can include many personal biases, emotions, etc., therefore we should:
   A. use judgemental results only for descriptive purposes.
   B. teach only those skills and kinds of information which can be measured.
   C. avoid judgemental processes whenever we must depend on the results.
   D. use measurement processes whenever the information needed lends itself to measurement.

3. If we compare the results of an evaluation based on measurement to those gotten from a judgemental evaluation, the results of measurement will:
   A. give a clearer picture of the situation or condition evaluated.
   B. depend less on evaluator's technical competence.
   C. contain less evaluator's bias in scoring.
   D. be an exact description of the situation.

4. Which of the following evaluative tasks would be most appropriately undertaken using a judgemental process? Evaluate the student's ability to:
   A. repair an automobile tire.
   B. estimate the cost of a floor tiling job.
   C. arrange a centerpiece for a banquet table.
   D. diagnose a problem in an automobile electrical system.

5. The first step to be performed in making a test is to:
   A. list the measuring devices to be used.
   B. determine how long the test should be.
   C. determine what is to be evaluated.
   D. analyze the subject matter for possible items.

6. When a teacher substitutes a written (verbal) evaluation instrument for direct performance evaluation of a manipulative task, he primarily expects the results to:
   A. describe.
   B. diagnose.
   C. predict.
   D. do all of the above.

UNIT	UNIT EXAMINATION
9	EVALUATING INSTRUCTIONAL OUTCOMES

7. A major problem and first concern in stating criteria for a particular evaluation task is:
   - A. making them understandable to the persons to be evaluated.
   - B. finding good ways of measuring the criteria once they are selected.
   - C. wording the criteria in ways which demand the most realistic and exact answers.
   - D. deciding which criteria are most important for the task undertaken.

8. Which function of evaluation is least likely to be part of a teacher's work?
   - A. Diagnosing learning difficulties.
   - B. Student selection.
   - C. Guide to planning instructions.
   - D. Measure of instructor's effectiveness.

9. To the teacher the most important purpose of evaluation is:
   - A. to provide incentive for students.
   - B. to provide a basis for assigning marks.
   - B. to aid in improving instruction being given.
   - D. to provide standardization of instruction.

10. Suppose that you are the head of a vocational department and have two transfer students who must be placed in shop courses. They have had some experience. Which one of the following types of tests would best help you to determine in which course they should be placed?
    - A. Diagnostic.
    - B. Intelligence.
    - C. Achievement.
    - D. Prognostic.

11. A written test was prepared by instructor "A" and administered to his class. The students corrected their own tests and were allowed to keep their test papers. Which function of evaluation is most reasonably inferred from the instructor's conduct?
    - A. Measure of student achievement.
    - B. Guide to planning instruction.
    - C. Student selection.
    - D. Teaching device.

12. The example of the "over easy egg" used in the lesson developed important concepts concerning the relationship of verbal to performance evaluation. Which of the following concept statements is the most correct?
    - A. Verbal evaluations substituted for performance evaluations are not reliable enough to give acceptable results.
    - B. There is only one way to evaluate manipulative skills and that is through performance evaluation techniques.
    - C. Acceptably valid verbal evaluations can be used as a substitute for direct performance evaluation.
    - D. Performance evaluations waste too many "eggs" to be useful in formal instruction.

UNIT	UNIT EXAMINATION
9	EVALUATING INSTRUCTIONAL OUTCOMES

13. Which of the following is the better method for evaluating achievement in operating a motion picture projector?
    A. The students take comprehensive multiple choice type tests as a group.
    B. The students, individually, set up and take down the projector.
    C. The students take turns at showing complete movies to the group.
    D. The students, individually, take an objective type test with several varieties of questions.

14. The teacher's competence in his occupational field would have the most bearing on which of the following characteristics of evaluation instruments?
    A. Validity.
    B. Reliability.
    C. Scoring consistency.
    D. Administrative ease.

15. Which of the following statements is most clearly related to the reliability of a test?
    A. It measures the same thing each time it is given.
    B. It is understandable to all who take the test.
    C. It picks out the good students from the poor.
    D. It samples liberally all phases of instruction that are being tested.

Grouped Multiple-Choice

Directions: Which qualifiers of a good evaluation instrument found at the top of the page are implied or referred to in the statements below? Mark the letter of the term which you believe is implied or referred to by the speaker.

A. Reliability
B. Validity
C. Scoring consistency (objectivity)
D. Administrative ease

16. ___ "Mr. Smudnike, if you are going to correct this test be sure that you follow the key I made out, for the key is the only fair judge to all the students."

17. ___ "Bill, you have taken this three times and you have missed the same questions every time."

18. ___ "I wonder if this test will really tell me what the students know about the subject."

19. ___ "What is wrong with these students, I gave them a test yesterday and they did fine - today by mistake, I gave them the same test and they did poorly."

20. ___ "Although I gave the students many tests in this course and they all did very well, they still don't really know the subject matter of the course."

UNIT	ANSWER SHEET - UNIT EXAMINATION
9	EVALUATING INSTRUCTIONAL OUTCOMES

Name ______________________ Code No. ______________________

Date ______________________ Score ______________________

Discussion Leader ______________________

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

Before you begin the examination or while you are waiting for others to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

Appendix C

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER KEY - UNIT EXAMINATION
9	EVALUATING INSTRUCTIONAL OUTCOMES

Name ______________________________
Date ______________________________
Discussion Leader ______________________________

ANSWERS	INSTRUCTOR NOTES

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	●	○	○	○
2.	○	○	○	●
3.	○	○	●	○
4.	○	○	●	○
5.	○	○	●	○
6.	○	○	●	○
7.	○	○	●	○
8.	○	●	○	○
9.	○	○	●	○
10.	●	○	○	○
11.	○	○	○	●
12.	○	○	●	○
13.	○	●	○	○
14.	●	○	○	○
15.	●	○	○	○
16.	○	○	●	○
17.	●	○	○	○
18.	○	●	○	○
19.	●	○	○	○
20.	○	●	○	○

FILM SCRIPT UNIT 9	DR. ROBERT R. RANDLEMAN EVALUATING INSTRUCTIONAL OUTCOMES

AUDIO **VIDEO**

Good evening. This is the ninth in our series of 12 programs. Tonight we turn to the topic, "Evaluating Instructional Outcomes".

Evaluation is a term with which we are all abundantly familiar. We participate in the process daily in many diverse ways - if you read the fuel gauge in your car this morning you were evaluating your travel capability; if you listened to two sides of a disagreement between your children before dinner last night, you were evaluating the merirt of each.

Both situations were the same in that in both you were gathering, and weighing information which would then allow you to act in the most effective way toward a goal or objective. The difference between the two evaluations lay in the tools, so to speak, which were brought to the task. The gadget in the car allowed you to measure with reasonable accuracy, the gasoline at your disposal. Given familiarity with the operating characteristics of your car, you could, quite likely, decide how far you could travel with no more than 10% error. The situation with the children permitted no such measurement - your evaluation was a matter of judgement. Your knowledge of the children, your intelligence, your emotions, and mood were the tools you brought to that evaluative task.

Simply because all of us speak does not allow us to say that all of us speak well. In the same vein, the fact that we all "evaluate" does not necessarily imply that we evaluate well. I'm sure most of you watching tonight have run out of gas or watched a disagreement turn into a brotherly fight because you evaluated poorly or failed to evaluate at all.

Evaluation is a major function of every teacher. The intent of this unit of instruction is to help you, as you pursue the teacher's role, stay on the road and out of as many brotherly fights as possible

AUDIO	VIDEO
or in TV parlance, "Keep the tiger in your tank and off your back".	
In the past two minutes, I have used a number of terms: Evaluation and its two sub-divisions Judgement and Measurement	Evaluation Measurement Judgement Function Information Techniques and Instruments
I've also referred to Objective - a word familiar to you from previous units in this series. For the sake of easy identification and more definitive usage, I'll substitute term "function".	
And lastly, to gathering and weighing information which I will condense into the phrases "information, techniques and instruments". Let me take these singly and attempt to clarify the concept and process of evaluation by identifying several of the most important factors involved.	
If I were to ask each of you to evaluate this piece of sculpture, a great variety of responses would be forthcoming. Some would simply say "Evaluate? - why bother", some, "I like that", others, "--- huh!" or a few, "I don't know anything about it - I can't evaluate it". Except for the last group, most of the responses might be called personal, emotional biases without technical justification. That is - most of us have neither the training nor the consumer experience to judge the item effectively. When we are required to evaluate under such circumstances, we generally draw upon our fund of fuzzy and untested opinions. Hence, we make judgements of very questionable quality.	(Shot of a piece of modern sculpture)
If I were to ask you to evaluate this piece of furniture, most of you would	(Shot of an occasional chair)

AUDIO	VIDEO
proceed in quite a different way and arrive at a somewhat more qualified conclusion. Some of you have built and all of you use furniture. You immediately begin to consider some specific features - would it be comfortable, strong enough, would it go with other furniture in my house, etc. In other words, you would tend to isolate some criteria against which you could evaluate and you would then attempt to gather information about each criteria. Obviously, it would be very difficult to make a sound evaluation given only this TV picture to look at. So we would not be much better off than with the piece of sculpture. Given the actual object, each of you would be able to give a legitimate evaluation as a consumer authority or as a hobbiest or craftsman. The more complete your list of criteria and the more complete your knowledge of furniture construction, the greater importance that could be given to your judgemental evaluations.	
Our list of important terms now looks like this when we add the last two ideas mentioned. Obviously, we are a long way from the "It swings - huh" response to the piece of sculpture. Let's carry it another step or two. Turning back to the idea of criteria, what kind of information will best answer these questions about the chair?	Evaluation Measurement Judgement Function Information Techniques and Instruments Evaluator's Competence Criteria
"Is it visually pleasing?" "Is it comfortable?" "Is it strong?" The first item, "Is it visually pleasing?", depends on the evaluator's personal aesthetic preferences - taste - and is therefore a judgemental problem. We could break the item down into elements of good design, but it would still respond essentially to the individual's judgement. I'll put a check on the judgement side.	Measurement Judgement Is it visually pleasing? Is it comfortable? Is it strong enough?

AUDIO | VIDEO

The second item, "Is it comfortable?", could be answered for any one person were he to simply sit in it, which would be a technique of measurement rather than purely judgement, the individual's torso being the measuring instrument. Admittedly, it would be rather difficult to communicate the unit of measurement to someone else; still, a measurement it would be. A more easily transmittable indication of comfort for the average human torso would be gained by comparing the heighth of the seat and back, the angle of the back, etc. with the equivalent measurements from a chart on chair design specifications.

Criteria #2 then is answerable in a general sense through a measurement technique strongly tempered by judgement. Both judgement and measurement deserve checks.

The third item could be answered with exactness were we to indicate how strong is strong. Here a change in our question seems appropriate. If strong means that the chair must be able to carry a 600 pound load, then one could test it under a 600 pound weight and thence be able to say, "Yes, it is strong enough", or "No, it isn't - as the pile of pieces indicate." Thus we may check the measurement side for item three.

This last criteria is an example of one of our biggest problems in evaluation - What is the right question to ask? The old comedy query, "Do you still beat your mother?" has its counterpart in a great many teacher-made tests. Can the criteria we use or the question we pose be answered in a realistic sense?

Let's turn back a moment at this point and review the concept of evaluation thus far developed. Both our judgements and/or measurements need to be channeled by the establishment of criteria - that is, "What are the important features to be evaluated?" The more exact we make our criteria the better chance we have of collecting pertinent information whether it be subject to judgement or measurement.

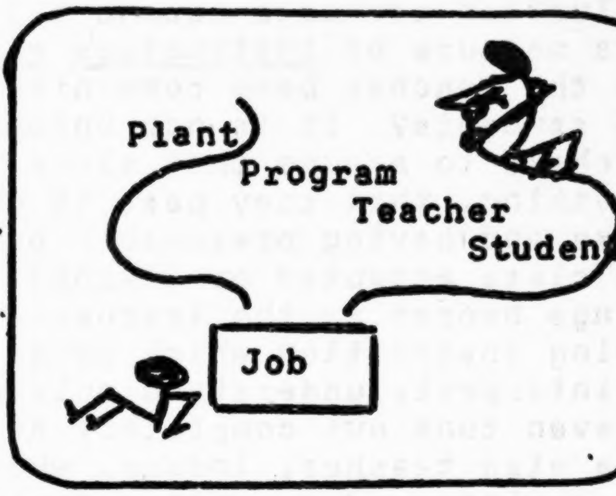
Evaluation
Measurement Judgement
Function
Information
Techniques and Instruments
Evaluator's Competence
Criteria

The evaluator's competence has an effect

AUDIO | VIDEO

in several ways. Greater competence in the subject under evaluation allows the evaluating person to develop more specific and inclusive criteria. To the layman, the question, "How well does your car run?", is answerable and sufficient _if_ the answer is "very well". If the answer is "very poorly", then the question becomes simply an annoyance to the layman the worthless to the mechanic. The capable mechanic is in a position to ask questions which lead to answers about what is now happening, why is it happening, and if this is changed, what will happen. In other words, the mechanic - or any qualified evaluator - needs to ask questions which demand information that will _describe_, _diagnose_, and _predict_. Whether we are concerned with evaluating mechanical performance, physical health, or classroom performance, we seek to judge and measure against specific criteria which demand information which will allow us to describe, diagnose, or predict. These are the generalized _functions_ of evaluation.

Examples used thus far have been about "things" rather than people. As we turn to the next block on our chart - Functions - I'll place my comment in an educational context. To ask what and why do we evaluate in education may seem to beg some very obvious answers. Sometimes pursuit of the obvious uncovers the inobvious, however. When we mention school, one tends first to think of the physical plant; then of teachers, of _courses_ he likes or dislikes - that is, the program of studies - and finally of students. So this is the package we work with. There is a natural impulse to assume that the student is the only object of evaluation and that a teacher who knows his subject can very easily decide whether or not the student has learned what he needs to know. In vocational education, we have a master evaluator to keep us honest also - if the student succeeds on the _job_ then the instruction has taken; if he fails, then the "student" obviously did not work hard enough while in school. Simple, isnt it.



AUDIO

You're quite right - of course it isn't simple. Whenever we have interaction between elements, which in themselves do not necessarily remain stable, we soon discover that cause and effect take some very devious paths. The eternal triangle in education - between program, student, and teacher - contains at least as many variables to confound the observer as the best of stories from "True Confession" Consequently, student achievement may head our list of Functions of evaluation but it must have many supporting purposes.

All of us are familiar with several techniques used to measure student achievement they range from many kinds of paper and pencil tests to actual on-the-job performance. We will reserve for the next unit in this series discussion of the ways in which such tests are developed.

Evaluation of student achievement should be a continuous process in an instructional program. It is the core of the fourth stage of instruction - followup - of which Dr. Moss spoke. It should also be an important teacher activity during both the presentation and tryout stage of instruction. At the latter two points, evaluation serves a second major function - as a measure of instructor's effectiveness. Has the teacher been communicating with his students? It is not uncommon for teachers to assume that since they know something, that they pass it on to the class and having presumably passed it on, the class accepted or learned it. Many things happen in the learner's mind during instruction which cause him to misinterpret, understand only partially, or even tune out completely at times. It is a wise teacher, indeed, who evaluates the quality and quantity of student learning as he works through the presentation and try-out stages of instruction.

A third function of evaluation becomes an apparent necessity once we have discovered a major difference between what we intended to teach and what some students learn. At

VIDEO

Functions of Evaluation
Student Achievement
Instructor's Effectiveness
Learning Difficulties
Teaching Device
Student Selection
Guide to Planning Instructio

AUDIO	VIDEO

that point, it is important to diagnose the learner's difficulty. Does the student have some handicap - sight or hearing deficiencies, a reading problem, insufficient dexterity - or may the problem be traced back to the preceeding item - instructor effectiveness.

Student selection is a fourth purpose, which typically is not handled by the classroom teacher, but which is of great importance to the teacher. For many reasons, every area of vocational education is concerned with enrolling the students who are most likely to succeed in that particular occupation. The better the selection process, the more efficiently may the training program be planned. Which leads us to the fifth point.

Evaluation as a Guide to Planning Instruction. The more a teacher knows about the students related background, learning rate, and other strengths and weaknesses, the more direct can be his approach to subject matter.

One might at this point note that these five functions of testing all fit under the terms description, diagnoses, and prediction which I used in developing the concept of evaluation at the beginning of this presentation.

The last Function of Evaluation that I will speak of, and for many teachers the most important one, is that of instruction - A teaching device - that is, evaluation can serve as a very effective teaching method. As all of us know - when we are being evaluated our attention is strongly focused on our work; correction of our errors has a particularly great impact on us; we are generally highly motivated, i.e. stimulated. Therefore, tests and rated exercises can be used to give added impact to the instructor's lesson. To be effective immediate correction of errors is, of course, necessary.

Let's return to our pot-bellied chart again and relate our list of functions of evaluation.

AUDIO

To insure the greatest economy for both student and educational institution, selection is appropriate.

Once enrolled, the student's level of achievement demands continuing evaluation.

We need a check on instructor's effectiveness, i.e. is he teaching what he thinks he is teaching - is he using terms or words that are not properly explained, has he left out information, has he really taught the content required by course objectives?

We need to check for possible learner difficulties - does the student have some problem which keeps him from profiting from instruction?

Evaluation can be used to aid planning - if students typically do poorly in a particular unit of content then the instructor has an indication of needed change in his instructional program.

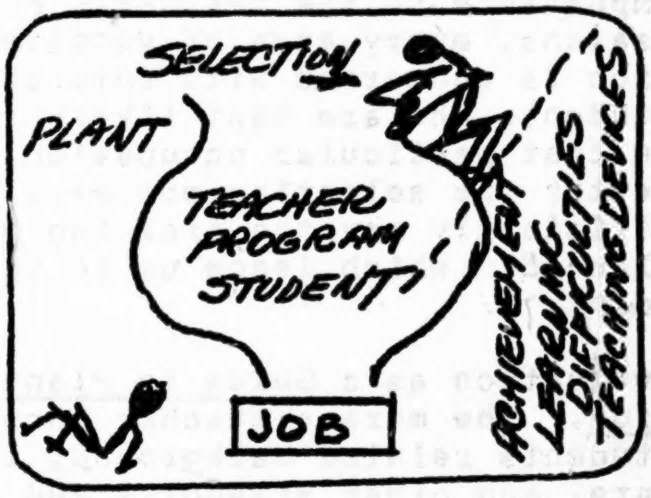
Lastly, we can use evaluation procedures as teaching devices to focus the student's attention on the most important details.

As important as the foregoing functions or objectives of evaluation might be, they do not possess any internal guarantee that all or any can be achieved. There are a number of conditions which need to be met before the results of any method of evaluation can be depended upon. I will pose these conditions as questions related to the techniques and instruments we use in collecting information in the evaluation process.

First, "Does the test really test what it is supposed to test? Is it a valid test?" This is not the ridiculous question that it may at first seem. To use a homely example; if one wishes to evaluate a student's ability to fry an egg "over easy", it cannot be done by simply asking the student to list the steps involved. Any of you who have tried to prepare a palateable "over easy"

VIDEO

Plant
Selection
Teacher
Effectiveness
Program
Achievement
Student
Learning
Guide to
Difficulties
Planning
Teaching
Device
Job



Techniques and Instruments
Is it valid?
Is it reliable?
Are scoring procedures consistent?
Is it administratively sound?

AUDIO	VIDEO

egg without breaking the yolk are well aware of the difference between being able to say how it is done and being able to do it. In this example, the actual performance of the task would be the only truly valid measure of ability.

Working conditions often make such complete performance evaluation impossible or impractical. A compromise which still gives us an acceptable degree of validity is found through the use of some method of evaluation that has a high predictive relationship to the ability or quality we are actually concerned with. For example, if we were to find by experience that nine out of ten students who correctly listed the steps in frying our now famous "over easy" egg could in fact do so in practice, we might feel that this listing approach is valid enough for our purpose. Certainly there would be less wear and tear on the eggs. The evaluating party most of course answer, for his own purpose, the question, "is the evaluation technique I have selected valid enough to do the job intended with a reasonable margin of error?"

A second condition with which one must concern himself when making and using evaluation instruments is referred to as test reliability. Again to put the point into question form, "will the student give the same answer to the same questions if we give him the test a second time?" or in an abbreviated form, "is the evaluation instrument reliable?" Let's take the "easy over egg" example again. If we decide that having the student cook list the steps is a valid enough test, then we next need to check its reliability. That is, will the evaluating instrument give us the same list, in the same order tomorrow if we test the student a second time. There are two rather apparent reasons for an unreliable test. One is the student's ignorance of the answer - that is, his answer is an entirely uninformed guess. The other lies in the way the test or the question is worded. If, for example, our egg-frying student were asked to list three of the seven important steps in frying an easy over egg, it is quite possible that on two different testing occasions he could and would answer the questions "correctly" with two different sets of answers. Thus it would be an unreliable test. We might note also that it would probably not be a very valid test either, since 3 out of 7 or even 6 out of 7 steps would not fry the egg properly. Nor would 7 out of 7 steps do the job if they were not in proper order. If we asked the student to list all seven steps we would have a much more reliable test. If we asked him to list all 7 in proper order, we would increase both reliability and validity.

Teachers have a similar problem with evaluation instruments - that is, there may be a problem in scoring the instrument. Our third question of condition thus becomes, "It is time to harp back to our two major subdivisions in evaluation - judgement and measurement. If a teacher must make a judgement about the correctness of a student's answer or answers, we can expect considerable variation in student scores. If, on the other hand, a teacher uses a definite, specific key or model answer - against which to check the student's answer, then we can expect a given answer to be given a consistent amount of credit. If answer "A" is correct today, it should be correct tomorrow as well - or if answer "A" is correct for George it must be correct for Ralph also. Unfortunately, it is not uncommon to find teachers using evaluation instruments and techniques which give George credit for answer "A", Ralph credit for "B", and Edward (who is a rather annoying character to work with no credit for either "A" or "B".

The fourth and last condition in our introduction to qualifying conditions can be simply stated, "Is the evaluation instrument administratively sound?" Is it practical and convenient to use? Or does the technique dement too much time, is it too hard to score, will it cost too much, etc. These are administrative problems in evaluation that too often force teachers to use less valid and efficient techniques than they would otherwise choose.

I'll take one more "crack" at our over-simplified egg example. One last time

AUDIO

"over easy". We can evaluate the student's ability to perform the task in two ways - one, perform the task under direct observation or give a verbal description of the operation. Which would be most valid? We must agree that the performance approach holds a better chance of "testing what we intend to test." From our first example we also concluded that the listing technique did the job for us 9 out of 10 times. So let's give the technique credit in this way.

Which is most reliable? If we ask the student to list 7 out of 7 steps in order, there seems little reason for one method to be more or less reliable than the other. That is, he can be expected to make the same list were he asked to do so a second time. His performance should be essentially the same the second time also, barring improvement due to practice. We'll give both "good" reliability.

Even casual consideration of the two techniques would suggest that the listing approach would tend to allow more consistency in scoring, since we can make a rather precise model list against which to measure the student's list. The observation necessarily holds many judgemental distractions - the student's dexterity, his working habits or just the problem of exactly what does a correct easy over egg look like. Let's color it this way - (Consistency? Satisfactory?) (Consistency? - Very Good).

Lastly, which technique has the fewest administrative problems. Obviously we can have 200 students make their lists in the same time that it takes one to do it. And they can do it without 200 ranges, 200 fry pans and 17 dozen eggs. Nor do we need 200 evaluators or one evaluator doing 200 evaluations. Mark them thus.

Which method would you use? If pressed to the ropes, all of us would of course take the verbal description - or paper and pencil - approach. But one of the important reasons behind good course organi-

VIDEO

Task: Fry Egg "Over Easy

	Perform		Describe
Validity	+	•	✓
Reliability	+		+
Scoring	✓		+
Administrative Ease	-	•	+

AUDIO

zation and proper selection of teaching methods is to avoid being forced to make such a black or white selection. Part of our next unit on evaluation will be concerned with development of an evaluation program that lets us, in a sense, "have our cake and eat it too."

In the last moments remaining, let me reemphasize the most important ideas just presented. Good evaluation depends on specific and pertinent criteria selected by sersons competent in the area. Good evaluation depends on the collection of sound information - exact as possible - under each criteria. The better we make our criteria and the more appropriate and complete the information, obviously the greater will be the validity of our evaluation. The more we depend on measurement rather than judgement, the greater will be our reliability and consistency in expressing results.

Putting this another way - the teacher who has competence in his subject matter area, who states his evaluative criteria realistically and specifically, who knows what information he must have, is in a good position to develop valid, reliable evaluative instruments to satisfy the specific functions he has chosen to work toward.

Evaluation is an inseparable part of the teacher's work. Its importance demands that it be done well.

Our next program in this series will be given to a description of some of the most immediately useful evaluation techniques; procedures that will give you, as a vocational teacher, the most mileage for the time and energy spent.

Good evening.

VIDEO

Evaluation

Measurement   Judgement
- Function
- Information
- Techniques and Instruments
- Evaluator's Competence
- Criteria

UNIT	SUMMARY OF FILM PRESENTATION
10	DEVELOPING EVALUATIVE MATERIALS

This summary of Unit 10 is planned for student use before viewing the film presentation. It is suggested that this outline be given to students at the close of Unit 9 as shown in the "Method of Approach" for Unit 9. In addition to a preview, the outline can also serve as review notes for this unit. The information outlined in blocks below is a duplicate of the visual materials shown during the video presentation.

Unit 10 - Summary Review

I. Review Terms and Concepts (regarding Unit 9)

Evaluation
Measurement Judgment
Criteria
Information
Evaluator's Competence
Functions
Techniques and Instruments

A. What is evaluation?
   1. collection of information
   2. interpretation of information
   3. leading to description, diagnosis, or prediction

B. Why do we evaluate?

Functions
Student Achievement
Instructor Effectiveness
Learning Difficulties
Teaching Device
Student Selection
Guide to Planning Instruction

C. What are the qualifying conditions?

Is it valid?
Is it reliable?
Is it scored consistantly?
Is it administratively sound?

D. Introduction of new topics
   1. observational evaluation
   2. performance testing
   3. written tests - test blueprint
   4. evaluation program

II. Observational Evaluation

A. An organized approach to observation

B. A running check:
   1. to detect learner error

UNIT	SUMMARY OF FILM (CONTINUED)
10	DEVELOPING EVALUATIVE MATERIALS

2. to indicate remedial instruction needed
3. to increase student motivation
4. which minimizes interference with student activity
5. which is highly valid
6. comprehensive
7. and economical

C. Techniques
   1. course objectives as basic criteria
   2. job analysis chart as criteria source
   3. printed rating
      a. an aid
      b. brevity and convenience
      c. 1 - 3 or 1 - 5 scale for consistancy
      d. consistants with criteria

III. Performance Tests

A. Controlled situations within class of observational evaluations

B. Concerned with speed, quality, and procedure

C. High validity

D. Direct Application of instructional ends

E. Administratively difficult

F. Nine steps in building a performance test
   1. select job or operation to be used
   2. prepare specification for the job
   3. list all the specific points that might be tested
   4. select points to be used in the test
   5. construct a check list of all points to be measured
   6. prepare directions for students
   7. prepare directions for administration
   8. select or construct devices for measuring or testing completed job
   9. try out and revise

IV. Written Tests - Test Blueprint

A. Written tests, as such demand extended treatment - refer to references.

B. Test Blueprint - "content - objectives - test analysis"

UNIT	SUMMARY OF FILM (CONTINUED)
10	DEVELOPING EVALUATIVE MATERIALS

	Test Blueprint		Level of Learning		
	The student will understand:	%	Factual Recall 20	Understanding 30	Application 50
Objectives			4	6	10
	Talking current	20			
	Induction coil	20			
	Capacitor Circuit	20			
	AC Line Current	20			
	Earphone Function	20			

1. aid in controlling test content
2. and test item distribution
3. and depth of learning measured
    a. recall
    b. understanding
    c. application

V. Evaluation Program

Evaluation Program			
	Observational Evaluation	Performance Tests	Written Tests
Knowing			End of logical blocks Unit tests Comprehensive final
Doing	Recorded observation every 4-6 hours of lab. activity	For diagnostic need Final evaluation	
Being	Spaced recording and incident anecdotes		Unit tests Comprehensive final

A. Aid to planning total evaluation program
    1. right technique for the task
    2. spacing and timing of evaluations

B. Aid in planning for different types of objectives
    1. knowing
    2. doing
    3. being

Note: Evaluation serves as an important teaching device as well as being important in more obvious ways. The more complete our evaluation program and the more concern we demonstrate for the proper feed-back of results to students, the better our overall teaching effort will be.

UNIT	TEACHER REFERENCES
9	EVALUATING INSTRUCTIONAL OUTCOMES

References:

A. Adams, Georgia Sacki, Measurement and Evaluation in Education, Psychology, and Guidance. N.Y., Holt, Rinehart, and Winston, 1964.

B. Micheels, William J. and M. Ray Karnes, Measuring Education Achievement. N.Y., McGraw-Hill Book Co., 1950.

UNIT	STUDENT EXERCISE SHEET
9	EVALUATING INSTRUCTIONAL OUTCOMES

Course Title ____________________ Time Alloted __________

A. Course objective number _______:

B. Behavior or kind of performance expected of a student who has achieved bbjective number _______:

C. Methods for evaluating the level and acceptibility of the expected performance:

1. Does the method/s require judgement or measurement?
2. How can the reliability and validity of the evaluative methods be justified?
3. Would the scoring or rating of the evaluation results be consistent?

Unit 10

Developing Evaluative Materials

TEACHER'S GUIDE

FOR

DEVELOPING EVALUATIVE MATERIALS UNIT 10

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining
filmed presentations and seminar discussions
designed to provide twenty-four clock hours
of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 10	INTRODUCTION

Unit 10, "Developing Evaluative Materials", is the second of two introductory units on evaluation. As in the preceding unit, the intent has been to establish a number of generalizations and provide an overview of the subject.

This unit contains five major divisions; (1) A review of Unit 9, "Evaluating Instructional Outcomes", (2) observational evaluation, (3) performance testing, (4) written tests and the test blueprint, and (5) the evaluation program. Seminar discussion could most profitably be directed at parts two and three as these are areas to which vocational instructors will have had the greatest exposure, hence possess the most adequate discussion base.

UNIT 10	OBJECTIVES

Participants in the program are expected to:

(1) Reinforce and expand basic terms in evaluation vocabulary.
(2) Understand the characteristics of three basic evaluation techniques--observation, performance tests, and written tests.
(3) Understand the basic structure and function of a test blueprint.
(4) Understand the basic structure and utility of an evaluation program.

The specific objectives (content) for attainment in this unit are:

STUDENTS WILL UNDERSTAND:

1. General Approaches to Evaluation
   A. Observational evaluations
   B. Performance testing
   C. Written (verbal) tests
2. Development of an Evaluation Program
   A. Evaluation techniques to fit objectives
   B. Comprehensiveness
3. Process of Observational Evaluations
   A. Criteria
   B. Rating sheets
   C. Frequency
   D. Advantages and disadvantages
4. Qualifiers for all Evaluation Methods
   A. Validity
   B. Reliability
   C. Consistency
   D. Administrative soundness
5. Development of Performance Tests
   A. Content selection
   B. Directions
   C. Scoring systems
   D. Tryout and revision
6. Factors Evaluated Via Performance
   A. Speed
   B. Quality
   C. Procedure
7. Use of the Test Blueprint
   A. Guide to selection
   B. Check on sampling
   C. Aid in weighing

UNIT 10	LESSON MATERIALS

The following teaching materials to help you with the teaching of this unit are included in this resource appendix. You will want to duplicate the number of necessary copies to use as you lead the seminar-discussion.

Material

A. The thirty-minute film, "Developing Evaluative Materials", may be obtained from the Director, Vocational Section, State Department of Education, Centennial Building, St. Paul, 55101.

B. Script of film, Developing Evaluative Materials. (Appendix D)

C. "Summary of Film Presentation" (Appendix E)

D. Unit 10 Test (Appendix A)

E. Unit 10 Test Answer Sheet (Keyed. Appendix B)

F. Unit 10 Test Answer Sheet - Student Form (Appendix C)

G. Sample Forms - Observation Rating Sheet (Appendix F,G)

H. Sample Performance Test Planning Outline (Appendix H)

I. "Levels of Understanding" (Appendix I)

J. References (Appendix J)

UNIT 10 | SUGGESTED METHOD OF APPROACH*

DISCUSSION LEADER	STUDENT ACTIVITY
1. Introduce unit with "Summary of Film Presentation" hand-out sheet. (Sample for duplication in the unit appendix) Advise students that this summary eliminates the need to take notes during the film viewing and that it can also be used later as review material. Elaboration of the "Summary" in the form of additional notes might best be accomplished during discussion.	1. Study the summary sheet for the kinds of items summarized.
2. Arrange for film viewing either individually or for a group.	2. View film for Unit 2, "Analyzing for Instruction".
3. Give Unit 2 Test. (copies and answer sheets duplicated previously from sample in the unit appendix) Advise students to mark only the answer sheets so that test forms can be used again.	3. Complete test answer sheet (no time limit)
4. Provide test answers.	4. Correct answer sheet. Mark test score on progress chart by code number. Instructor will provide code numbers.

*The same approach can be used for one student or a group of students. While this approach is a suggested one, it is suggested also that the teacher for whom this content is new follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 10 | SUGGESTED METHOD OF APPROACH

Continued--

DISCUSSION LEADER	STUDENT ACTIVITY
5. Initiate discussion from student test responses.	5. Return answer sheets to instructor.
6. Review idea of the observational rating and explain blank form (appendix F)	6. Develop a practice rating sheet on some non-manipulative (non technical) behavior expected of students.
7. After about 10 minutes of student work time select 2 or 3 samples for discussion.	7. Contribute evaluative comments on samples choosen.
8. Review the nine steps in developing a performance test - emphasize definition of "job" and "operation".	8. Give examples of "jobs" and "operations" in their technical area.
9. Expand discussion of student identified jobs and operations into ways points could be measured or judged.	9. Specify ways to evaluate a given performance.
10. Distribute blank performance test exercise sheets (appendix H) and explain. Assign a practice task and discuss suitability of some examples of jobs or operation identified by students.	10. Outline a performance test on a selected job or operation.
11. Lead discussion of one or two student outlines after 10-15 minutes of work time.	

UNIT 10 | SUGGESTED METHOD OF APPROACH

Continued--

DISCUSSION LEADER	STUDENT ACTIVITY
Alternate or Additional Activities	
12. Distribute appendix G, "Levels of Undertanding" and allow study time.	12. Read, and make interrogatory notes on "Levels of Understanding".
13. Lead discussion of appendix I.	13. Quire for clarification.

Appendix A Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	UNIT EXAMINATION
10	DEVELOPING EVALUATIVE MATERIALS

Directions: Select the one best alternative from among the four alternatives presented in each item. Darken the circle on the separate answer sheet corresponding to the alternative you have selected.

1. The broad function (describe, diagnose, predict) of a given evaluation technique essentially depends upon:

   A. the kinds of test items used in the instrument.
   B. how the evaluation results are used by the evaluator.
   C. the point at which the test is used - entry into school, during the program, or upon completing the program.
   D. whether the instrument is a written test, performance test, or an observation.

2. Observational evaluation differs, most importantly, from the performance test because performance testing:

   A. involves the use of a precise rating sheet.
   B. involves a conscious selection of the most important points to be evaluated.
   C. demands a more realistic work situation.
   D. lends itself to a better coverage of all kinds of student behavior.

3. Which condition would be the least difficult to build into observational evaluations?

   A. validity
   B. reliability
   C. scoring consistency
   D. ease of administration

4. It was suggested that a 1-3 or 1-5 scale be used on rating sheets. Which of the following statements best justifies the point?

   A. Scales with finer divisions make the rating sheets too large for 8½ x 11 paper.
   B. More precise discriminations, such a 1-10, are not expected to be necessary on the job.
   C. The need to make finer discriminations tends to result in less consistent rating.
   D. Students understand the scale better than some more complex system.

5. In constructing a test blueprint, the instructor is concerned with:

   A. kinds of test items to be used
   B. levels of understanding to be evaluated
   C. the reliability of the evaluative instrument to be used
   D. none of the above

UNIT	UNIT EXAMINATION
10	DEVELOPING EVALUATIVE MATERIALS

6. Evaluation may be described as essentially a process used to:

A. motivate students to pay attention to the important details.
B. increase the teacher's effectiveness in obtaining instructional goals.
C. determine what a teacher needs to teach next in his course.
D. identify errors in students' performance and understanding.

7. The practice of basing evaluation of student achievement on observation of students at work is understood to be:

A. good, because instructors know their own objectives and therefore know what to observe.
B. poor, because the time involved in observing and rating individual students is impractical.
C. good, because it makes a very direct and valid measurement of the student's ability to use and apply things taught.
D. poor, because the instructor can do no more than make subjective appraisals of students' ability and understandings.

8. Which reason would be most important for including the "try-out" step in the list of steps for developing a performance test?

A. to make sure all equipment is working properly.
B. to remove or correct ambiguous directions and requirements.
C. to make sure the job isn't too difficult.
D. to produce a model product against which to compare the student's work.

9. The more important justifications for the statement that, "The performance test can give a valid and reliable evaluation of student behavior assessable in no other way" is that the performance test:

A. tests the complete range of student behavior
B. removes the need for the student to read well or have high general intelligence
C. allows the instructor to check the student's work under practical, tension-loaded conditions.
D. reflects the relationship between the physical and mental components of performance.

10. Which condition is the most difficult to achieve in developing a written test?

A. validity
B. reliability
C. scoring
D. ease in administration

11. The purpose of the test blueprint is to:

A. aid in developing a comprehensive evaluation instrument
B. increase the reliability of the instrument
C. reduce the number of items needed in the instrument

UNIT	UNIT EXAMINATION
10	DEVELOPING EVALUATIVE MATERIALS

12. A major value to be derived from an evaluation program is that it:

    A. insures the validity and reliability of the evaluation technique used.
    B. provides a testing calendar which allows the instructor to place his evaluations appropriately.
    C. clarifies the variety of appropriate evaluation techniques and the areas in which they may best be used.
    D. guarantees the construction of comprehensive tests that cover the range of course content.

13. Which of the following appeared as a column heading in the evaluation program chart?

    A. performance tests
    B. course objectives
    C. levels of understanding
    D. none of the above

14. A significant educational value in any evaluation process is derived from the:

    A. feedback of evaluation findings to the student
    B. comparisons that can be drawn between classes
    C. evidence it provides to administration about the quality of instruction
    D. motivational impact it has on the slow student

Grouped Multiple-Choice

Directions: Which of the three evaluative techniques at the top of the page may best warrant the advantages given below? If an advantage reasonably fits all three techniques, use choice 'D'.

A. Observational Evaluation
B. Performance test
C. Written test
D. All of the above techniques

15. Provides an incentive for quality student performance.

16. Combines direct identification of errors with immediate corrective instructions.

17. Typically assumed to include consistent, objective scoring techniques.

UNIT	UNIT EXAMINATION
10	DEVELOPING EVALUATIVE MATERIALS

18. Involves no artificial disruption of student work time.

19. Places major emphasis on speed, quality, and correctness of procedures in student performance.

20. Allows for great economy in time, materials, and equipment.

UNIT	ANSWER SHEET - UNIT EXAMINATION
10	DEVELOPING EVALUATIVE MATERIALS

Name ______________________ Code No. ______________
Date ______________________ Score ______________
Discussion Leader ______________________

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

BEFORE YOU TAKE THE TEST OR
WHILE YOU ARE WAITING FOR
OTHERS TO FINISH

1. When did you see the telecast?
   - MON ( )
   - WED ( )
   - NONE ( )
   - AT HOME ( )
   - SCHOOL, BEFORE CLASS ( )

2. What was the quality of the TV reception?
   - GOOD ( )
   - FAIR ( )
   - DIFFICULT ( )

3. Have you ever studied the content of this unit before?
   - YES ( )
   - NO ( )

4. Did you take notes?
   - YES ( )
   - NO ( )

5. Any remarks that would help the author make the presentation better for you?

UNIT	ANSWER KEY - UNIT EXAMINATION
10	DEVELOPING EVALUATIVE MATERIALS

Name ____________________
Date ____________________
Discussion Leader ____________________

ANSWERS	INSTRUCTOR NOTES

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	●	○	○
2.	○	●	○	○
3.	●	○	○	○
4.	○	○	●	○
5.	○	●	○	○
6.	○	●	○	○
7.	○	○	●	○
8.	○	●	○	○
9.	○	○	○	●
10.	●	○	○	○
11.	●	○	○	○
12.	○	○	●	○
13.	●	○	○	○
14.	●	○	○	○
15.	○	●	○	○
16.	●	○	○	○
17.	○	○	●	○
18.	●	○	○	○
19.	○	●	○	○
20.	○	○	●	○

FILM SCRIPT	DR. ROBERT R. RANDLEMAN
UNIT 10	DEVELOPING EVALUATIVE MATERIAL

AUDIO	VIDEO
Good evening.	
This tenth program in our series is titled, "Developing Evaluative Material." Tonight I will present an all too brief overview of the mechanics involved in evaluation.	
Let me first review the concept of evaluation as it was developed last week. Simply stated, evaluation is the process of collecting and interpreting information so that we may describe, diagnose, and/or predict behavior; presumably on some relative value scale. That is, we evaluate so that we can say that, as described, student A does more poorly than, as well as, or better than, the model student or the model performance that we have chosen. Through further interpretations of the information we might also identify some of the areas in which the student is performing poorly and hope to diagnose the cause so that we may administer an educational aspirin. And finally, we evaluate so that we may predict, with reasonable confidence, whether or not, or how well the student will perform in subsequent situations.	
In defining the process of evaluation I used this tag word chart. Under evaluation are two methods which are far from being mutually exclusive as we use them. It should be apparent that very often our best effort to measure is based first upon judgement of what and how to measure and finally we apply judgement to the results of our measurement - how important are the results obtained from our measurement. The important distinction between measurement and judgement to be understood was that measurement tends to give us a more stable and specific treatment of information.	EVALUATION MEASUREMENT-JUDGMENT CRITERIA INFORMATION EVALUATOR COMPETENCE FUNCTION TECHNIQUES AND INSTRUMENTS

AUDIO

Whether we measure or pursue a purely judgmental evaluation, we must begin with the identification of criteria. We might say that this is identical to the development of objectives in course and lesson planning. Criteria isolate and clarify the intent of evaluation. They tell us precisely what we are after. They indicate the nature and extent of the information we must have. This information may be acquired by simply watching the subject, by administering a paper and pencil test, by taking the readings from some instrument or whatever.

The more competent the evaluator is as evaluator and as a practitioner in the subject field, the more realistic and complete will be the criteria and derived information. I think it only fair to warn you of possible "hard times" coming by assuring you that competence in your specialty by no means quarantees that you will be a particularly competent evaluator.

Our next consideration was that of function - what are the purposes for evaluation. Student achievement was the overriding function, and I'm sure the function from which others will stem in most of your programs. From evaluation of student achievement we may further make inferences about instructor effectiveness, attempt to diagnose learning difficulties in some students, and certainly capitablize on the very large instructional potential which lies in evaluation as a teaching device.

Evaluation instruments constructed for specifically diagnostic and prognostic purposes help us select students who can be expected to profit from instruction and further help us develop programs of instruction geared to the students before us.

VIDEO

FUNCTION
- STUDENT ACHIEVEMENT
- INSTRUCTOR EFFECTIVENESS
- LEARNING DIFFICULTIES
- TEACHING DEVICE
- STUDENT SELECTION
- GUIDE TO PLANNING INSTRUCTION

AUDIO	VIDEO
The last point reads techniques and instruments. This will be the focal point for this evening. But before pursuing the subject, let me conclude this review with the qualifiers we attached to any evaluation method - the first of which was, "Is the evaluative instrument valid?" Does it truly measure what we intend that it measure? Second, "Is it reliable?" Can we expect the instrument to elicit consistent responses. Third, "Can it be scored with consistency?" And fourth, "Is it administratively sound?" Can we use the instrument or technique without creating time, material or money problems? We will find that whatever system or method of evaluation we might attempt to use, these are questions that need to be answered affirmatively. It makes no difference, in essence, whather our evaluation takes the form of a highly judgmental set of observations or a very precise paper and pencil test, the approach must be valid, reliable, permit consistency in scoring or recording, and be administratively sound.	TECHNIQUE & INSTRUMENTS -IS IT VALID -IS IT RELIABLE -IS IT SCORED CONSISTANTLY -ADMINISTRATIVELY SOUND
With that brief review, let us turn to the four major points for this evening. Observational evaluation, performance testing, written tests, and an evaluation program. I have selected the topics and placed them in that order because most of you will find yourselves building an evaluation program generally in that order. Typically, the inclination of teachers in manipulative fields places extensive emphasis on direct observation of the student's behavior patterns in general, and his production pattern specifically. This is as it should be, however, it is much too easy to let such observation become random and	-OBSERVATIONAL EVALUATION -PERFORMANCE TESTING -WRITTEN TESTS -EVALUATION PROGRAM

FILM SCRIPT	DEVELOPING EVALUATIVE MATERIAL
UNIT 10	PAGE 4

AUDIO	VIDEO
unrecorded. The term, Observational Evaluation, suggests a more conscious and organized approach. If organized effectively, the observational evaluation process not only provides a running check of student achievement, but also provides an overall context within which results of other, more precise evaluative techniques, can be viewed. The fact that organized observation does constitute a running check on student performance is a major advantage of this evaluation process. It places the instructor in a position to detect performance errors at all levels of student activity and to take appropriate remedial action without waiting for the error to show in a finished product. If this sounds simply like "good teaching", you're quite correct - evaluation and good teaching are inseparable and generally one and the same. The parts of the teacher's classroom evaluation program should always serve as teaching devices. The instructor who pursues an organized and purposeful observation pattern soon finds that he has added an essential vehicle for instruction and a source of student incentive to his course. Another benefit of the observational evaluation technique is that the instructor can carry the process without disturbing student work time in general. As we take up the topics of performance testing and written tests, this benefit will become especially apparent. The validity of such an approach to evaluation is obvious in that the instructor would necessarily draw upon the ongoing course activities for his evaluative incidents. There would be no middle man, so to speak, in the form of constructed tests. Assuming that the course content itself is realistic and validly selected,	

AUDIO

there seems little question that the observational evaluation process can go wrong. There are, however, a number of problems concerning reliability - I will take this up in a few moments.

Observational evaluation further allows a comprehensive coverage of student performance. As the student progresses through the course, the instructor has frequent opportunities to observe the full range of behavior - the student's safety practices, his interpersonal relationships, how he handles materials and tools, even how the student cares for his or her finger nails if that happens to be a factor in job success, as it may well be.

Finally, observational evaluation offers an apparent economy in equipment, materials and student's time. One needs no special setups, time blocks, etc. Nor does the student face the psychological problem of testitis - evaluation becomes a part of the ongoing instructional program.

Now that we have an idea of the what and why, let me spend a few minutes on the "how". As in any evaluation process, the logical place to begin is with the course objectives - what are the significant acts or behavior patterns we wish the student to develop?

Before you is an excerpt from a communication unit outline showing objectives concerned with "doing"; thus presenting themselves to the observational process. As stated here the objectives are rather broad, and might best be broken down into more specific statements for purposes of guiding observation. For example, the instructor might ask himself, "At what points in the construction of a one tube radio would it be most profitable to check the students' progress, observe

VIDEO

PUPIL WILL BE ABLE TO:

1, Diagram & test an earphone
2. Construct a one tube amp.
3. Construct a grid detec. radio.
4. Construct a diode tube radi
5. Construct a plate detec. radi

PUPIL WILL:

1. Cooperate in checking circuits requiring the service of more than one student.
2. Check over each circuit carefully before connecting the power supply to A.C. outlet

AUDIO	VIDEO

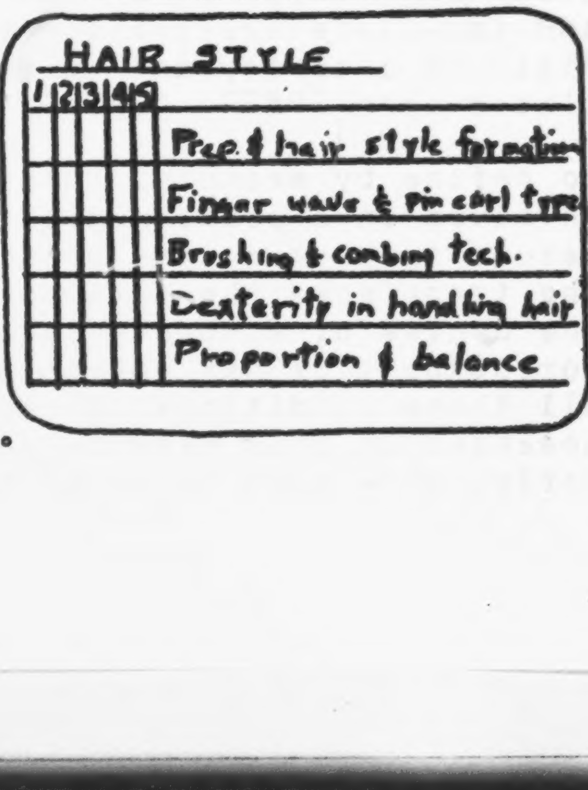
his manipulative skill, or possibly infer his depth of understanding of principles involved?" Other source for this information would be a job analysis chart - one could identify the most appropriate steps within each job as focal points for his observations.

This section of objectives from the same unit require another kind of observational intent. Here the behavior requires that the observer "take it when it happens." The important assistance gained from noting the objectives lies in the fact that the instructor is reminded that the particular kind of behavior needs to be among his observation focal points.

After identification of activities and behavior to be observed, the instructor may formalize them in several ways - a common and convenient method is the printed rating sheet listing the points to be observed and space for entry of a rating and/or brief comment.

The cosmetology instructor in this photo is making an observational evaluation of a student working a hair styling unit. She will record the results on this brief form, using a numerical rating for brevity and convenience. Note space for remarks. A cautionary point may be well taken concerning rating systems. When we exercise largely a judgmental function, as we do in making observational evaluation, 1-3 or 1-5 rating scales have been found to give more consistent results than scales which demand finer discriminations. I think most of us find it more difficult than useful to attempt to differentiate between possible ratings of 6 and 8 on a ten point scale rather than between 3 and 4 on a 5 point scale. Some adaptations of the superior, above average, average, below average, fail levels seem most functional for observational evaluations. Brief comments on exceptional performance or behavior should also become a habit with the evaluator.

SLIDE OF COSMOTOLOGY
STUDENT AND
TEACHER.



HAIR STYLE

1	2	3	4	5	
					Prep. & hair style formation
					Finger wave & pin curl type
					Brushing & combing tech.
					Dexterity in handling hair
					Proportion & balance

AUDIO	VIDEO
The rating sheet is only as useful as the instructor makes it, of course. If it is used as part of an organized program of evaluation, kept current and consistent with the course activities, and exploited as a guide or reminded of important aspects best evaluated through observation of normal student performance, it becomes a significant aid to instruction rather than a clerical impediment.	
Discussion of observation techniques reminds me of a conversation with a Japanese gentleman with whom I worked while in service. I asked whether or not the state of undress in Japanese co-education public baths proved to be overly distracting for the young men. His reply was that a gentleman often looks but never sees the nudity of his fellow bathers. Since our view, as teachers, is somewhat different, it seems imperative that we do at least as much seeing as looking - which is the sense behind aids and organization in observational evaluation.	
Our second major subject this evening is performance tests. We might look upon performance tests as very precise, organized, and highly controlled situations within the general class of observational evaluations. Both have many common characteristics. We resort to the same indicators of content - primarily doing objectives and job analysis. We make similar measurements and judgements. The primary difference lies in the instructor's control and immediate supervision of the student's field of activity and in the emphasis placed upon SPEED, QUALITY, AND PROCEDURE.	
To define by example, this young lady is involved in a performance test which will result in a score based on how rapidly she transfered the data to punched cards, the degree of accuracy maintained, and the correctness of her operating procedure. All three conditions can be accurately measured in this example and the students performance then compared to on-the-job	SLIDE OF STUDENT AT CARD PUNCH

expectations. Her level of training becomes a qualifying factor of course. Note that there is no consideration given to behavior outside of the three specified under test.

Irrespective of the job or area of work - welding a fillet, taking a patient's blood pressure, or changing ignition points - the evaluator expects the performance test to produce results which reflect the speed, quality, and correctness of procedures demonstrated by the student.

Performance tests have some particular advantages - they can be designed to give valid and reliable evaluations of student behavior assisable in no other way with equal validity. When evaluating any manipulative operation one must recognize that the task is accomplished through a combination of mental and physical activity. To de-emphasize or restrict either tends to reduce both validity and reliability of the test results. As we noted last week, you can't really fry an "over easy egg" with just words.

A second advantage lies in the diagnostic potential in performance tests. The close observation of a defined task in process allows the instructor to identify often very subtle errors in student performance. It may thus serve as a check on his own teaching procedure as well.

Finally, the performance test has the asset of being a direct application of instructional ends.

The obvious negative features include administrative problems - performance tests are time and material consumers. Pressure on the student produced by particularly close observation and time restrictions often lessen student efficiency.

AUDIO	VIDEO
A very brief explanation of the nine steps involved in building performance tests must be sufficient for our purposes tonight.	
1. Select the job, or; operation/s to be used. This involves a detailed identification of all the steps involved in the test job. 2. Prepare specifications for the job. This may consist of drawings and/or verbal specifications. 3. List all the specific points that might be tested. 4. Select points to be used in the test. We generally find it necessary or appropriate to only sample the possible list of steps which could be measured. Selection should ordinarily begin with the most significant steps in the job.	1. Select the job 2. Prepare specifications. 3. List specific points. 4. Select points to be used 5. Const. a check list.
5. Construct a check list of all points to be measured. The check list is similar to the rating form mentioned earlier though it is far more specific. Proper construction of the list along with well-thought-out rating scales and systems of measurement will add greatly to scoring consistancy. 6. Prepare directions for students. 7. Prepare directions for test administrators. 8. Select or construct devices for measuring or testing the completed job.	6. Prepare directions-students 7. Prepare directions - admin. 8. Device for measuring or testing the completed job. 9. Try out test & revise.

AUDIO	VIDEO

Often one finds that instructor-made devices will greatly speed the scoring process.

9. Try out the test and revise.

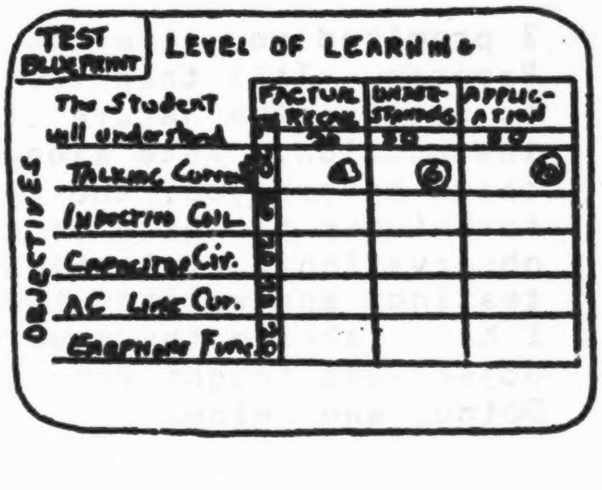
Most teachers have found the first trip around with a new test to be a very disappointing experience. Just as parents too frequently fail to see short comings in their own children, so also do we find test makers swinging a sows ear and calling it a silk purse.

Time tells me we must turn to our third topic--written tests. All of us have taken enough of them to be familar with the method. Breadth of application, objectivity, and administrative convenience are acknowledged assets of answer recognition kinds of written tests.

It would be simple enough to spend a half hour on the characteristics of each type of item--certainly one could write a book on it and several authors have. So let me leave to your initiative, for the time being, the task of learning to search and sink the wily "ambiguous stem: and cage the uncontrolled "cues" and all the rest of the menagerie of semantic and gramatic creatures that raise havoc with objective test items.

I'll speak rather of a system of controlling the content and distribution of items within a test. The term "content-objectives test analysis" describes the process and has that nice two dollar ring, but I'll use its short title-test blueprint.

This technique is exceedingly useful in guiding the construction of a test that measures what we want it to measure in the way we want it measured. That is, it helps us attain test validity and comprehensiveness. The column labeled "level of learning measured" indicates the depth of learning tapped by test items. That is, must the student simply recognize a



AUDIO

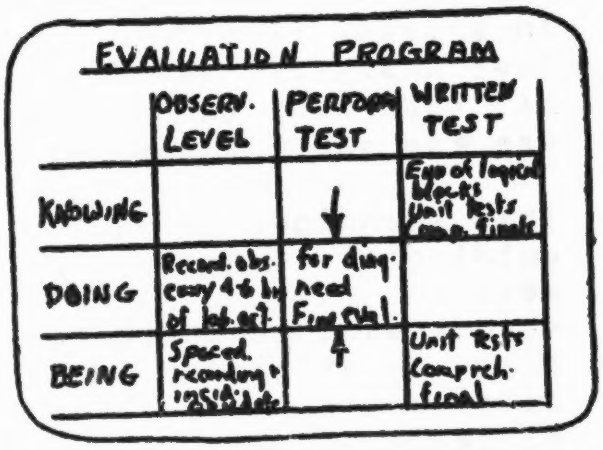
memorized term or figure, or does the item force the student to develop significant relationships from what he has learned.

The rows channel us to unit content. Note that I have excerpted a group of "knowing" objectives which read, "the student will understand. . ." Thus, we have a grid system which leads us to develop a test which has a distribution of items among the several unit objectives and written to tap different levels of student learning. The instructor's competence as a specialist in the subject and as a teacher properly gives him the prerogative to decide on the proportion of test items to be included in each row and column and within each cell. Here I have indicated heavy emphasis (50%) at the applicative level and equal distribution among the objectives (20% each). For a 100 item test, this set of percentage distribution would require development of 4 factual recall questions on the objective, "talking current", 6 understanding level items and 10 application items.

Assuming development of good test items, the use of a test blueprint becomes an effective aid, if not quite a guarantee, in building a valid instrument that will measure the desired range of student learning.

I promised you comments on the Evaluation Program. I'll take the last few moments to outline the nature of such an aid to instruction. Note along the top of the chart before you, the types of evaluation techniques to which we have spoken--observational evaluation, performance testing, and written tests. On the right, I have labeled the rows with the kind of objectives taught for; i.e., Knowing, Doing, and Being.

VIDEO



EVALUATION PROGRAM

	OBSERV. LEVEL	PERFORM TEST	WRITTEN TEST
KNOWING		↓	Exp of logical blocks Unit tests Comp. finals
DOING	Record. obs. every 4-6 hr of lab act.	for diag. need Fine eval.	
BEING	Spaced. recording + [illegible]	↑	Unit tests Compreh. final

FILM SCRIPT	DEVELOPING EVALUATIVE MATERIAL
UNIT 10	PAGE 12

AUDIO	VIDEO
Within each cell of the chart are indicated the ways in which we might use each evaluation technique to get at achievement of each kind of objective. For example, under the heading "Written Test" and opposite the objective type, "Knowing", I have indicated that a written test could well be used at the end of each logical block of material. That is, we might wish to use unit tests, final tests, or short quizes at the conclusion of instruction on some major concept. Under "Observational Evaluation" and opposite "Being", we find the notation: "Spaced observation with incidental recording as appropriate." The arrows in the top and bottom center cells indicate that though performance testing is firstly concerned with "Doing" objectives, they also reflect to a large degree, the attainment of "Knowing" and "Being" objectives. The conscious development of the relationships and placement of evaluation techniques and objectives serves to encourage a more thorough and effective approach to evaluation. This leads to a final comment which should become a constant reminder to any teacher: Evaluation serves as an important teaching device as well as being important in more obvious ways. The more complete our evaluation program and the more concern we demonstrate for the proper feed-back of results to students, the better our overall teaching effort will be.	

UNIT	SUMMARY OF FILM PRESENTATION
11	MANAGING TEACHING-LEARNING FACILITIES

This summary of Unit 11 is planned for student use before viewing the film presentation. In addition to a preview, the outline can also serve as review notes and as a foundation for elaboration by the student during discussion. The information outlined in blocks below is a duplicate of the visual materials shown during the video presentation.

Unit 11 - Summary and Review

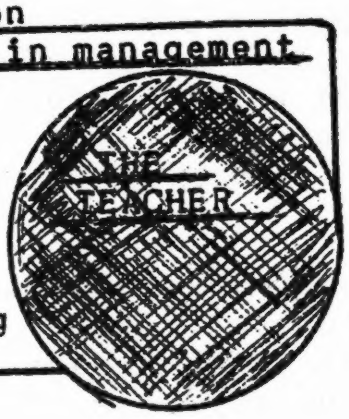
I. Facilities Management Considerations

A. Purposes of the physical plant

1 1. facilitate instruction
2. aid to developing skills and knowledge
3. the first question - "How well does the facility serve the teaching function?"

B. Factors involved in plant planning and development

1. teacher-administrator cooperation
    a. initiative
    b. communication
2. major divisions in management
    a. budget
    b. layout
    c. equipment
    d. lighting
    e. ventilation
    f. storage
    g. housekeeping
    h. maintenance



3. need to:
    a. maintain
    b. replace
    c. update
    d. expand

II. Expansion of Selected Topics

A. Budget

1. plan ahead
2. keep administration informed of intent and desire

B. Layout

1. equipment placement
2. work space
3. traffic lanes
4. power
5. storage
6. scaled grid layout aid
7. efficiency a first cause

UNIT	SUMMARY OF FILM (CONTINUED)
11	MANAGING TEACHING-LEARNING FACILITIES

C. Standards in your field

1. recommended square footage
2. light levels
3. traffic lanes
4. safety features

B. Equipment

1. use advisory groups
    a. advisory council
    b. commercial commuhity
    c. state department
2. keep abreast of changing conditions in your field

E. Lighting

1. impact of light and color
    a. general morale
    b. safety
    c. absentiesm
2. use of artificial light
    a. greater control
    b. avoid contrasts
    c. match light levels and needs
3. use lighting consultants

III. Some General Reminders

A. The maintenance problem in teaching

B. Develop "housekeeping" routines

C. Impact of ventilation and temperature on the learner

UNIT	SAMPLE FORM-OBSERVATION RATING SHEET
10	DEVELOPING EVALUATIVE MATERIAL

Date____________________ Student Observed______________________________

Behavior

1. (General Statement) |________|________|________|________|

(Specific example of best performance)

(Specific example of very poor performance)

2. |________|________|________|________|

3. |________|________|________|________|

4. |________|________|________|________|

X. |________|________|________|________|

Appendix G

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	SAMPLE FORM-OBSERVATION RATING SHEET
10	DEVELOPING EVALUATIVE MATERIAL

Date______________________ Student Observed______________________________

Behavior **Scale**

1.

2.

3.

4.

X.

Comments: ____

____

____

____

Appendix H

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	SAMPLE PERFORMANCE TEST PLANNING OUTLINE
10	DEVELOPING EVALUATIVE MATERIAL

Operation or Job Title: (Step 1) ____________________

Specifications: (Step 2 - clarify title and define condition of end product) ____________________

____

Directions: (Step 6 - state conditions clearly) ____________________

____

____

	Inventory of possible points or stages at which performance may be checked	Points choosen for evaluation (check)	Methods and instruments to be used in checking
1.	(Step 3)	(Step 4)	(Step 5)
2.			
3.			

UNIT	LEVELS OF UNDERSTANDING[1]
10	DEVELOPING EVALUATIVE MATERIAL

The lowest level of understanding is found in arbitrary or "nonsense" associations. An arbitrary association is one which has no reason or explanation. Why shall this stuff be called "iodine?" Why was this man's name "Christopher Columbus?" Why does "five" come after "four?" One cannot answer. These items need to be learned, and they can only be learned in a rote fashion. Too often, however, the school also treats associations which have genuine meaning as if they were only arbitrary sound patterns. Facts and dates of history or procedures and "facts" in arithmetic, are capable of explanations, and if the student learns them, he masters the material more thoroughly. The only way we can test whether a pupil knows an arbitrary association is to ask him to repeat it verbally. This sort of "parroting" is an adequate test. If the association has some deeper meaning, however, we should test him in ways which require more understanding.

The second level, representing at least superficial understanding, is shown when the learner gives examples of the principle, or actually solves a problem where it is relevant, or restates the principle in his own words. Behavior like this shows that the principle is connected in his mind with real objects and events. A correct response on tests of this nature does not by itself indicate complete understanding. The pupil may only parrot the examples given him by the teacher, or he may have been taught to solve the particular problems he is tested on. Success on these tests does indicate that his principle is useful to him but does not show that he understands it fully.

The deepest tests of understanding are: (a) Does the pupil use the principle in solving unfamiliar problems to which it applies? and (b) Can he explain why the principle is true by relating it to other principles? Both of these tests can be met more adequately as education progresses. Probably we could never say that anyone understands any aspect of science, history, or human behavior so thoroughly that he could not improve. If he has limited understanding he can use his new idea for just a few situations. His first explanations may be very simple, but he can gradually bring the principle into relation with more and more other concepts.

---

[1] Excerpt from Chapter 10, "Learning of Concepts and Principles," in Cronback, Lee J. Educational Psychology, New York: Earcourt, Bruce & Co. 1954, pp. 296, 297.

UNIT	TEACHER REFERENCES
10	DEVELOPING EVALUATIVE MATERIAL

References:

A. Micheels, William J. and Karnes, M. Ray. Measuring Educational Achievement. New York: McGraw-Hill Book Co.; 1950.

B. Adams, Georgia Sacks. Measurement and Evaluation in Education, Psychology and Guidance. New York, Holt Rinehart & Winston; 1964.

C. Stecklein, John E. "Bulletin on Classroom Testing". Minneapolis: University of Minnesota Bureau of Institutional Research. (This is a series of twelve bulletins, the most pertinent to this unit are: #1 "Why Do We Test?"
#3 "What Is A Good Test?"
#9 "How to Make A 'Content-Objectives' Test Analysis"

Unit 11

Managing Teaching-Learning Facilities

TEACHER'S GUIDE

FOR

MANAGING TEACHING-LEARNING FACILITIES | UNIT 11

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining
filmed presentations and seminar discussions
designed to provide twenty-four clock hours
of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 11

INTRODUCTION

Unit 11, "Managing Teaching-Learning Facilities", is, by necessity, a very general entry into the area of plant management. The most important outcome of class discussion will be the development of an instructor awareness of the potential impact of facilities on instruction. The discussion leader should attempt to take specific examples, of concepts presented, from the class members rather than over-generalize arbitrarily selected points.

Reference to administrative policies in the field may well be drawn from the discussion leader's background to give perspective to the role beginning vocational teachersmay be expected to play concerning management.

It should be emphasized that many of the activities and responsibilities mentioned in this unit occur only rarely or intermittantly, while others need to become a continuous effort in the instructor's day to day program.

UNIT 11 OBJECTIVES

Participants in the program are expected to:

(1) Understand the nature and breadth of the technical teacher's management responsibilities.
(2) Understand several generalizations concerning layout of facilities; i.e., the scaled layout method, space utilization, traffic patterns, and work space.
(3) Recognize the desirability of cooperative effort between teaching staff and administration in development and up-grading of physical facilities.
(4) Recognize the physical plants potential for impact on the teaching-learning process.

The specific objectives for attainment in this unit are:

STUDENTS WILL UNDERSTAND: cognitive principles, theories, concepts

1. Purposes of Facilities Management
    - A. Facilitates Instruction
    - B. Increase Teacher Effectiveness
2. Teacher's Role in Management
    - A. Initiator
    - B. Cooperator
    - C. Communicator
3. Good Management
    - A. Maintains
    - B. Replaces
    - C. Updates
    - D. Expands
4. Management Areas
    - A. Budget
    - B. Layout
    - C. Equipment
    - D. Lighting
    - E. Ventilation
    - F. Storage
    - G. Housekeeping
    - H. Maintanence
5. Aid to Layout
    - A. Scaled Grid
    - B. Scaled Equipment Simulations
6. Impact of Physical Plant on Learner
    - A. Safety
    - B. Morale
    - C. Instructional Convenience

UNIT 11 | LESSON MATERIALS

The following teaching materials to help you with the teaching of this unit are included in this resource appendix. You will want to duplicate the number of necessary copies to use as you lead the seminar-discussion.

Material

A. The thirty-minute film, "Managing Teaching-Learning Facilities", may be obtained from the Director, Vocational Section, State Department of Education, Centennial Building, St. Paul, Minn. 55101.

B. Script of Film, Managing Teaching Learning Facilities

C. "Summary of Film Presentation"

D. Unit 11 Test

E. Unit 11 Test Answer Sheet (keyed)

F. Unit 11 Answer Sheet, Student Form

G. Grid Sample

H. "Some Factors that Determine the Location of Equipment in the Laboratory"

I. References

UNIT 11 SUGGESTED METHOD OF APPROACH*

DISCUSSION LEADER	STUDENT ACTIVITY
1. Introduce unit with "Summary of Film Presentation" hand-out sheet. (Sample for duplication in the unit appendix) Advise students that this summary eliminates the need to take notes during the film viewing and that it can also be used later as review material. Elaboration of the "Summary" in the form of additional notes might best be accomplished during discussion.	1. Study the summary sheet for the kinds of items summarized.
2. Arrange for film viewing either individually or for a group.	2. View film for Unit 11, "Managing Teaching-Learning Facilities".
3. Give Unit 11 Test. (copies and answer sheets duplicated previously from sample in the unit appendix)	3. Complete test answer sheet (no time limit)
4. Provide test answers.	4. Correct answer sheet. Mark test score on progress chart by code number. Instructor will provide code numbers.
5. Initiate discussion from student test responses.	5. Return answer sheets to instructor.

*The same approach can be used for one student or a group of students. While this approach is a suggested one, it is suggested also that the teacher for whom this content is new follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 11 | SUGGESTED METHOD OF APPROACH

Continued---

DISCUSSION LEADER	STUDENT ACTIVITY
6. Review some common problems in commercial shops or work areas. Discuss samples identified by students.	6. List a number of common problems in working conditions in places of employment.
7. Discuss "housekeeping" activities expected of students in a training facility.	7. List some of the "housekeeping" activities expected of employees on-the-job in your field.
8. Alternatives to be used in lieu of or in addition to number 7 above: A. Discuss maintanence a activities expected of employees. B. Have students sketch a sample layout of a training facility in their area for a class of fifteen students. Use copies of the grid included in the appendices. C. Refer to Appendix G for other topics which may be discussed.	

UNIT	UNIT RESOURCE APPENDIX
11	MANAGING TEACHING-LEARNING FACILITIES

RESOURCE MATERIAL

A. Unit Test

B. Unit Test Answer Sheet

C. Unit Test Answer Key

D. Film Script

E. Hand-Out Film Summary

F. Grid Sample for Student Excercise

G. "Some Factors That Determine the Location of Equipment in the Laboratory"

H. Teacher References

UNIT	UNIT EXAMINATION
11	MANAGING TEACHING-LEARNING FACILITIES

Directions: Select the one best alternative from among the four alternatives presented in each item. Darken the circle on the separate answer sheet corresponding to the alternative you have selected.

1. Which of the following is most true of the teacher-administrator cooperative relationship?
   A. A good teacher knows when to inform the administration of a change and when not to.
   B. Some changes the administrator needs to know about and others he does not.
   C. In the event of any change, an administrator should know what is happening.
   D. None of the above.
2. The initial responsibility for the development and updating of a given instructional facility lies with the:
   A. teacher
   B. administrator
   C. advisory council
   D. all of the above
3. The beginning point for sound and progressive facilities management lies in the:
   A. instructor's awareness of the conditions needed for a good teaching-learning environment.
   B. availability of a large and well lighted physical plant.
   C. cooperative attitude of administrators and the flexibility of administrative policy.
   D. availability of funds with which to purchase equipment and remodel instructional areas.
4. A number of points were stated as concerns of federal legislations on public education. The points were also called "imperatives" for the vocational educator, and are listed in which of the following responses?
   A. Budget, maintenance, and replacement.
   B. Budget, replacement, and updating.
   C. Maintenance, replacement, expansion.
   D. Replacement, updating, and expansion.
5. Which practice was identified as typical of budget policy among our vocational schools?
   A. Instructors are normally allocated an inviolate sum with which to operate their program.
   B. A base operating fund is set and additional expense must be met by income from service work.
   C. The central administrative officer controls the funds and disperses them on the basis of demonstrated need.
   D. No typical pattern exists; budget practices vary according to the policies at individual institutions.
6. The generalization was made to the effect that instructional facilities are:
   A. the responsibility of the local administrator.
   B. prone to obsolescence; the instructor must therefore constantly press for additional funds.
   C. representative of conditions in the occupation and should faithfully reproduce its conditions.
   D. first and foremost, aids to the development of the appropriate discipline.
7. Included among the sub-topics under the heading of "Layout" was/were:
   A. power outlets.
   B. dead storage.
   C. reference materials space.
   D. all of the above.

UNIT	UNIT EXAMINATION
11	MANAGING TEACHING-LEARNING FACILITIES (CON'T)

8. Which system best describes the scaled grid system suggested for laying out a facility?
    - A. It is a convenient variation of a scaled model technique.
    - B. It is a convenient system for checking alternate locations of equipment and/or furniture.
    - C. It is a convenient method for assigning work space and traffic lanes in mechanical trade ships.
    - D. Statements A, B, C are equally correct.
9. The most unique solution to the storage problem, shown in the TV presentation, was/were the:
    - A. panels which were pulled up to the ceiling.
    - B. materials storage and cut off equipment grouping at point of entry.
    - C. satellite accessory panels which folded into wall sections.
    - D. all of the above.
10. The primary consideration in selecting a tool and accessory equipment storage system for a given facility is/are the:
    - A. system used by establishments which employ graduates of your program.
    - B. traffic patterns identified as normal during instruction.
    - C. instructional utility inherent in the storage systems under consideration.
    - D. cost and space required by the storage systems under consideration.
11. Which of the following subordinate topics was not included under the heading, "lighting"?
    - A. Power outlets
    - B. Wall color
    - C. Minimum light level
    - D. Contrasts in light level
12. Poor lighting in a work area can have negative effects on students':
    - A. Overall work habits
    - B. Safe working practices
    - C. Quality in performance
    - D. All of the above
13. Where new facilities are being planned it was suggested that lighting and decoration problems be given due consideration by:
    - A. assuming complete dependence on artificial lighting.
    - B. researching the available literature on lighting and painting.
    - C. developing a shop layout plan.
    - D. acquire the services of a lighting and interior decoration consultant.
14. The minimum light level, in foot candles, specified for general work areas was:
    - A. 35
    - B. 45
    - C. 55
    - D. 65
15. Consultation on equipment purchase might well be carried on with:
    - A. advisory council.
    - B. employing agencies.
    - C. state supervisory personnel.
    - D. all of the above.
16. A major reason given for developing a sound "housekeeping" program is that it would:
    - A. reduce the excessive work load of the custodian.
    - B. reduce the environmental hazards and improve shop safety.
    - C. improve student character and general work habits.
    - D. demonstrate good teacher-administrator relations.
17. Maintenance of equipment should be handled by:
    - A. contracting with some outside agency.
    - B. assigning it to students as a learning activity.
    - C. the instructor who assumes it as part of his teaching load.
    - D. none of the above are sufficient.

UNIT	UNIT EXAMINATION
11	MANAGING TEACHING-LEARNING FACILITIES (CON'T)

18. When developing the layout for an educational facility, which of the following factors should receive first priority?
    A. Economy
    B. Good illumination
    C. Adequate storage
    D. Safety
19. Comments on interior decoration were included under the topic:
    A. layout.
    B. lighting.
    C. housekeeping.
    D. none of the above.
20. The apparent intent of this unit of instruction (program #11, managing teaching-learning facilities) was to:
    A. encourage awareness of the important factors in developing effective physical conditions.
    B. specify the most important qualifications and details involved in facilities management.
    C. compare the advantages inherent in different layouts and other physical conditions such as storage.
    D. none of the above.

Appendix B

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER SHEET - UNIT EXAMINATION
11	MANAGING TEACHING-LEARNING FACILITIES

Name ______________________ Code No. ______________________
Date ______________________ Score ______________________
Discussion Leader ______________________

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

DISCUSSION POINTS

Before you begin the examination or while you are waiting for others to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER KEY - UNIT EXAMINATION
11	MANAGING TEACHING-LEARNING FACILITIES

Name
Date
Discussion Leader

ANSWERS	INSTRUCTOR NOTES

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D
1.	○	○	●	○
2.	●	○	○	○
3.	●	○	○	○
4.	○	○	○	●
5.	○	○	○	●
6.	○	○	○	●
7.	●	○	○	○
8.	○	●	○	○
9.	●	○	○	○
10.	○	○	●	○
111.	●	○	○	○
12.	○	○	○	●
13.	○	○	○	●
14.	●	○	○	○
15.	○	○	○	●
16.	○	●	○	○
17.	○	○	○	●
18.	○	○	○	●
19.	○	●	○	○
20.	●	○	○	○

UNIT	DR. ROBERT R. RANDLEMAN
11	MANAGING TEACHING-LEARNING FACILITIES

AUDIO	VIDEO

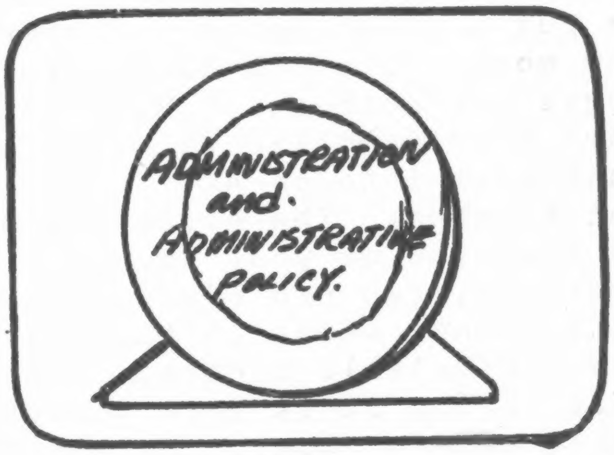
Welcome once again to your favorite 5:30 show. Tonight I'll attack the topic, "Managing Teaching-Learning Facilities". We may not overwhelm the subject, but at least we'll frighten it a bit. I am well aware of the variety of occupations represented among you who view, and I'll try to keep this from sounding too much like a shop planning lecture.

One might look at the home as an example or source for many of the guidelines followed by the effective teacher-manager. We put a great amount of time and effort and money into our houses to make them serve our purposes. Many of you are more than familiar with the planning that goes into an attractive and convenient kitchen. The effort is spent primarily so that you or your spouse if you have any backbone, can provide for the family's nutritional needs in the most efficient and comfortable manner. When you buy an easy chair, it is selected for comfort first and foremost. We attempt to decorate with an eye to visual comfort and relaxation, because a very large function of the home is to provide just that - comfort and relaxation. Op art wall paper may be great in the game room, but all of us would find it distressing in the living room.

Op Art Overlay.

We attempt to construct, organize, manage, and use for a set of purposes. The more clearly we see the purposes and the more realistic the purposes are, the greater the satisfaction we gain from our homes.

So it is in the educational setting - our first purpose is to facilitate instructions and learning. Our product is the disciplined hands and mind of each student. Our facilities are, first and foremost, aids to the development of the appropriate discipline - skills and knowledge - within each student.

AUDIO	VIDEO
A kitchen doesn't have to smell like bacon grease and boiled cabbage to be a kitchen. Nor do your "classrooms" need to look like 1910 sweat shops, smell like lysol or reek of hair spray. As many of you begin your first teaching assignment, I suggest as a first quest and question, "How well does my facility serve the teaching function - what will make it better?" ... which brings us to the core of our topic for this evening - what makes a facility "good" and what can make it "better"?	
On my right is a teacher's "wheel of fortune", so to speak - I have it well covered with a first thought for you - "Administrators and Administrative Policy." I place this first and with emphasis because administrative policy and your administrator as a fellow educator carry the responsibility for developing and maintaining the most effective educational program possible with the resources available.	 ADMINISTRATION and ADMINISTRATIVE POLICY.
Vocational school directors in our state have come to their positions via a route not too unlike that which each of you are following. They are very much aware of what it means and what it takes to educate a student who "can do and does know." Personally I have never worked with an administrator who would not make appropriate changes if at all possible. Once in a while even the "possible" takes a little time, of course.	
Speaking of changes, I'm sure every teacher with any initiative has felt somewhat like the gentlemen in this cartoon. The caption reads, "I've got a plan."	
Assuming that most of you are not Houdinis resurrected, I'll offer you two keys to the not infrequent dilemma of desire for but no visible means to educational facility improvement - the first is your own initiative.	
You will need to identify the "what", the	

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AUDIO	VIDEO

"why", and the "how much". Your administrator has a school to cover; you have one classroom.

The second key is "Teacher-Administrator Cooperation". Not all changes need involve the administration, but all administrators need to know what is happening. Whatever you undertake, as teacher, in developing your educational facility, an informed administrator makes part of the working team.

These two keys - initiative and cooperation - need to be used together.

Assuming that most of you will become reasonably well-keyed teachers, let me quickly identify some of the major areas of concern under tonight's topic. You noted a moment ago that at the center of the wheel lay the teacher. As we progress through our subject, keep in mind that the central positions must not indicate a state of enclosure but rather a position of control - a point from which to manipulate the surrounding conditions.

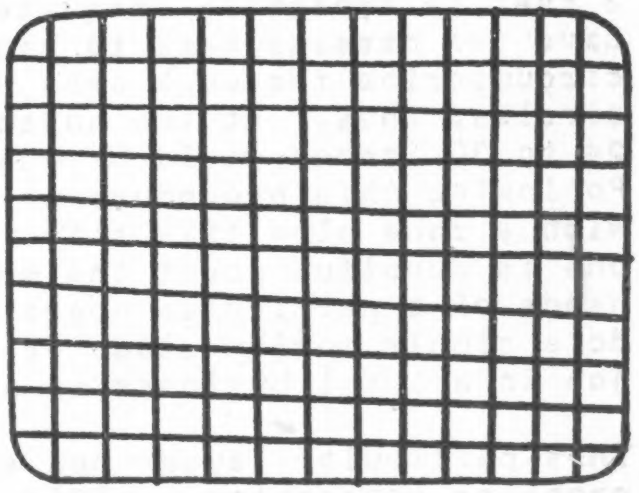
The spokes on this representation of the facilities management subject are not all inclusive by any means, but reflect significant areas of concern. Rolling with once around, these sub-topics appear:
Budget
Layout
Equipment
Lighting
Ventilation
Storage
Housekeeping
Maintenance.
And on the circumference:
Replecement
Up-dating
Expansions.

AUDIO	VIDEO
The last three points comprise the whole move. Just spokes won't get us far. One of the more damning criticisms of education in general has been aimed at education's inability to maintain currency - to keep up with the times. A primary interest of the federal legislation concerning education is centered on updating and expansion of general education.	
In vocational education we must keep up or get out. There is small market, indeed, for yesterday's skills and last year's knowledge. Thus it is and will be imperative that the vocational teacher constantly attach his management activities to the updating, expansion, replacement concepts. These must become a state of mind in vocational education.	
I will turn now to the individual topics or our management wheel. Some people assert that money makes the world go round; some of us know that is not true at all, but we'll humor the idea for a moment. Budget policy tends to be a rather individual thing among institutions. Practices range from that of alloting an inviolate sum with which the instructor must operate, to a totally unspecified budgeting arrangement. Wherever you may find yourself in the range of practices, one piece of advice has consistent applicability; plan as far ahead and as specifically as possible. And keep your administration informed of your needs and intent. Long range improvements in physical facilities, in particular, depend on sound budget practices which means first, planning by the instructor, and secondly, a thoroughly informed and cooperative administration. In brief, don't try to overpower the dollar bill; it's bigger than all of us.	
Our next heading - Layout - covers a number of subordinate subjects; equipment placement, tool and accessory storage, work space, and power outlets. Taking these in order, let me apply a previous	

AUDIO | **VIDEO**

admonishment to the problem of equipment placement. Early in the program I mentioned that instructional facilities are precisely that - the facilities should be established in ways that expedite instruction. If on-the-job practices are violated in the process for the sake of teaching efficiency, then the violation is justifiable.

A useful aid to equipment placement specifically and the whole topic of layout in general is some variation of the scaled model. The grid system shown here is a scaled representation of the floor space available in a hypothetical classroom. At ½" to 1 foot this represents a rectangular room 18' by 24', with windows on the north and two doors on opposite ends of the east wall. By simply cutting out scaled cardboard pieces to represent the equipment to be installed, one may visually check out the most effective arrangement.



(place pieces - ad lib)

Use of such an aid might have prevented the problem shown here. This piece of equipment is built for a 360° swing of the operating lever. As shown here, the swing is restricted to about 200°. Certainly, after the fact expediency sometimes forces us to make such installations, the point remains that we should take every precaution to avoid building such errors into a facility which is still in the alternative stage.

Placement of equipment and furniture carries two immediately related considerations - work space and adequate passage for movement of materials, and activities of other bodies in the instructional area.

I've replaced the moveable sealed tube with an overlay showing their final arrangement. Although this happens to represent a machine shop layout, we could very easily generalize the ideas and apply them to any other vocational area.

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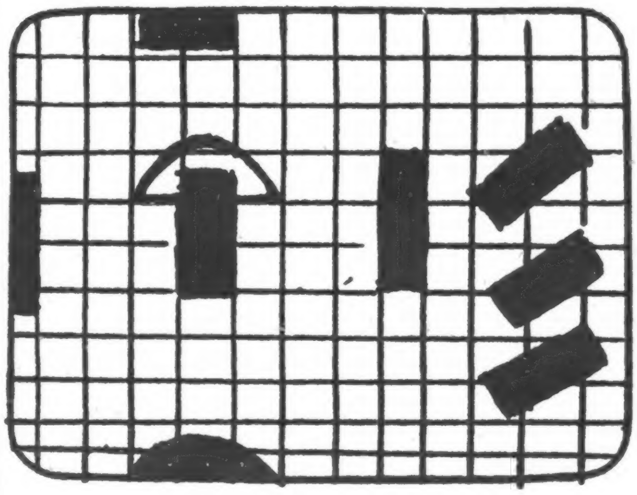
AUDIO	VIDEO



Specific standards for optimum square footage and configuration of operator's work space are generally unavailable, so a few rules of thumb plus your own knowledge of your occupation's working needs will have to guide you. First, areas around machines or work stations should be large enough to allow free operator movement throughout his normal range of activity. For the drill press represented here, a radius of 3 feet is typically adequate. As we have two presses back to back, we may circumscribe the work area with two half circles, thus. At the adjacent punch, 24 to 30 inches would be adequate. Following this procedure we might end up with a zone plan like this (Overlay). If one is doubtful about the work space needs of a particular operative, he might do a simple motion study of a man on the job in a local business or another shop.

This particular layout has some apparent problems concerning traffic lanes. At this point (press and bench) the service aisle is lapped by work spaces. Not only does this represent an inconvenience, but more important, a safety hazard. We would expect a reasonable amount of traffic between the west wall equipment and the east wall tool panels. Other points of congestion plus the flow of material between operations could give us a traffic pattern such as this (overlay).

It becomes apparent at this point that the initial layout contains serious inadequacies and that some revision is needed. Possibilities would be relocation of some machines, a redesigned bench, and location of tool panel section points adjacent to appropriate work stations. Or we would concievably come to the conclusion that the floor space considered is simply not adequate for the intended program.

Adequate or not, many a program has been and still is, run under such conditions, by necessity. Contrast this situation with the conditions shown in the next

AUDIO **VIDEO**

slide. (Pause 5 sec., punch up next slide).

METAL SHOP SLIDE

There is no question concerning the excellence of the program and instruction which has taken place in the first setting. One might well question, however, the degree of handicap and the extent of the strain on the teachers who work such a facility.

The second and third rules of thumb have already appeared in the preceeding comments. One was that traffic lanes should be adequate - generally at best three feet wide - and should not be impinged upon by any work space.

The third point may be stated, "Avoid extended, criss-crossing, and repetitious traffic flow". Steps saved reduce fatigue and accident potential. Duplication of equipment and accessory, if bugetarily feasible, may be a solution to the latter problem, and should not be overlooked.

Moving on to the next items under layout, let's consider location and handling of tools and accessories. Central, controlled tool and material dispersal systems are common in industry and other technical occupations. The tool crib, stockroom, dispensary are examples of this system. If adaptation of these systems have instructional value in your program then they should, by all means, be used. If such is not a consideration, then some arrangement should be designed to incorporate the greatest degree of utility possible. On our layout I have indicated a tool panel such as this. These have the advantages of compactness and maximum contralized accessibility. (Pause 5 sec.)

SLIDE OF ROLL-AWAY TOOL PANEL

Another type is this multiple panel cabinet which increases compactness at the cost of immediate accessibility. (Pause 5 sec.)

Or one might bring the mountain to Mohammed. This roll away rack has much to commend it particularly if wall space is limited or

AUDIO | **VIDEO**

the facility is so organized that work stations are group and each group lends itself to a special set of tools and accessories.

The system that one selects depends, of course, on the needs of his own program and the nature of the overall facility. Another look at our hypothetical machine shop leads me to suggest that here one might very well disperse the system by placing satellite panels near work stations. (Overlay showing small panels) An accessory panel mounted on the lathes with a chuck rack on the cabinet, a small panel for these work stations, and possibly an open island panel on the bench would free the wall area for another use.

"Another use" could mean live storage space. In this layout there are four obvious locations for materials and product storage - corner, under the bench, panel wall and entry. Were one of you to work this shop, I'm sure you would need to take advantage of all these possibilities. A direct example of good space utilization and proper layout is shown in this view of a metals stock rack and work station.

Note that the material is stored at the point of entry. It is accessible, and it need not be further transported before being cut to length; thus reducing the volume of material moved. This can be an important safety factor in some facilities.

Another unique solution to storage is shown here. It may look a bit Rube Goldbergish, but it's hard to beat for utility. Components and assemblies are mounted on panels which can be hoisted ceiling-ward when not in use and pulled down to form work stations when needed. I would wager many a teacher has thought of this but never had the guts to try it. This idea deserves the gold plated pully award.

SLIDE OF CEILING HUNG
TOOL EQUIPMENT PANEL

AUDIO

This represents a storage problem that is yet to be solved. Like - good luck.

One of the slowly disappearing annoyances of our age in homes and schools is the mislocation of power outlets. One apartment I've lived in had one outlet per room, and one of those was at the end of an extension cord. Many instructional areas have the same problem. Provision for adequate and convenient power outlets - and we might include other utilities under the same thought, that is, compressed air, water, and gas; - provisions for these should be given early and serious consideration.

The buss bar arrangement shown here is extremely convenient where appropriate. The decision to use inset floor outlets, wall mounted boxes, buss bars or some combination depends on your program. Buss bars in a beauty salon would seem to leave something to be desired, aesthetically speaking.

The concern for safety reflected in the provisions for adequate power outlets, I think, is obvious. And safety is always a paramount factor in planning any educational facility.

Let's turn the wheel one more notch.

I am in no position, obviously, to make specific comments on the kind of equipment each of you out there in TV land will need. A few very pertinent generalizations are within the scope of this presentation, however. The first point is that each of you, should you be employed in a vocational program, will have recourse to advisory groups superior in many ways to those available to any other breed of teacher.

If you need advice on kind or variety of equipment needed to work your program or to upgrade or expand it, your adviser council, the community of employers who

VIDEO

SLIDE OF TV SHOP

SHOP SCENE

AUDIO

hire your graduates, and your state supervisory personnel enjoy positions which qualify them to give such advice. My best advice on advice is to take advantage of those sources.

If a vocational teacher really works at it, he too can get in an educational rut with an obsolete program. Fortunately, evaluation of vocational program success tends to be too constant and immediate to allow advanced stagnation. Yet the point is worth emphasis. Take every advantage of opportunities to keep abreast of of your specialty. Much of the necessary updating will be carried to you, but there is really no substitute for individual initiative and vitality concerning one's own area of instruction.

The next topic on the wheel is "lighting".

Light and color are essentially inseparable in our lives, and so too in any instructional setting. All of you, with a bit of retrospection, could isolate personal examples of the impact of light levels and color on your own mood, ergo morale. Most of us have recognized the fatigue and idstemper which build in a poorly lighted work situation. In production work, light level and decorative coloring have an important effect on accident rate, absenteeism, and production in general. Simply note the impact of these two shop situations.

It seems to me that schools have been, historically, notorious for their lack of application of good light and color application. If I wished to become depressed, there are any number of classrooms to which I might retire and be well served in the disinterested interior - in some even the sunshine seems to wait just outside the window.

The excuse for such conditions may be monetary but I would wager it lies as frequently in lack of awareness of importance. With or without good illumination,

VIDEO

SHOP SCENE
SHOWING LIGHTING
FACILITIES

AUDIO

we often see poorly which suggests that we make a conscious effort to identify sub-standard conditions.

There is a reasonable amount of literature available on illumination and wall treatment. A few specifics may be useful as examples of points of concern.

If we may turn once more to our simulated layout, we might first note the placement of the window wall machines. Their quartering position serves a dual purpose - over the shoulder illumination and a line of work offset, that is, should the material be thrown from the lathe it would tend to miss the operator on the next machine. Returning from our tangent - dependance on natural light has long ceased to be a significant consideration in most of our fields, and it would be prudent to plan new or update present facilities on an artificial illumination basis. Specifications of 35 ft. candles as a general work area minimum needs of course to be supplemented, depending on the kind of activity under way. Proper treatment of wall and ceiling surfaces, indirect general lighting, and proper use of color combinations in immediate work areas contribute to good light diffusion. High contrasts in light levels are typically undesirable and contribute to eye strain and operator fatigue.

It would seem prudent if a question exists about standing conditions - and certainly if a new facility is planned - to acquire the aid of a light and interior decoration consultant.

As we close for the evening, a last few running comments must suffice. Though all areas have not been covered, nor have we more than touched the topics spoken, the implications of each should stimulate your own thoughts.

For the person who has worked at a specialty, there is little need to remind him of

VIDEO

OVERLAY

SAMPLE
IN
APPENDIX

FILM SCRIPT	MANAGING TEACHING-LEARNING FACILITIES
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AUDIO	VIDEO
maintenance needs of his own equipment. The needs become even more pressing in the teaching situation and demand an instruction centered approach. Housekeeping routines and policy need to become habitual with students. Your safety program may depend greatly on these homey practices. Ventilation and temperature control can drastically change the students learning posture. It is a poor reason, indeed, to tolorate odors, heat, and noise, simply because such are common problems in run-of-the-mill business. Our coverage tonight has only been a reminder. Your awareness of the areas is the first step to good management. Goodnight.	

UNIT	SUMMARY OF FILM PRESENTATION
12	VOCATIONAL-TECHNICAL TEACHING AS A CAREER

The final unit, Unit 12, in this series will give you some suggestions about planning your won teaching careers beyond this first twenty-four clock hours of instruction.

Obviously, there has been insufficient time to develop any one of the separate units. Likewise, there are other topics which have not been touched at all; so, there remains a good deal of additional work for all of you before you will have attained the title of "Master Teacher".

The last unit will develop these ideas further and suggest the next logical steps for you to take in career planning. In doing this the following topics will be used.

Unit 12 - Summary Review

I. Your further in vocational teaching
    A. Twenty-four clock hours and initial certification
    B. Importance of organized courses
    C. Other plans for obtaining clock hours of credit
    D. A teacher's responsibility for taking courses
    E. Degree work

II. Kinds of teachers
    A. All-day trade teachers
    B. Evening extension teachers
    C. Part-time teachers

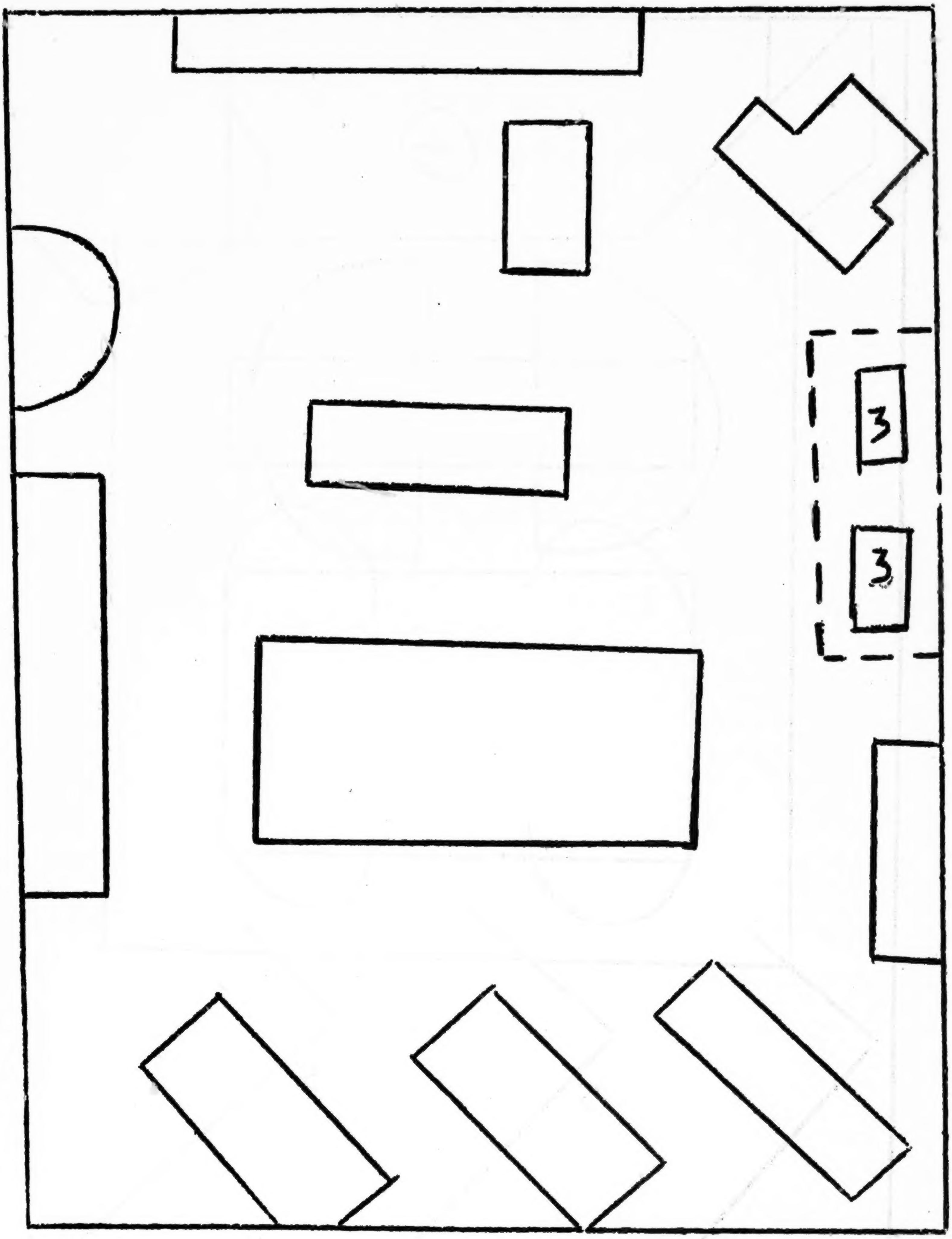
III. Selected books, references, and resources

IV. Area Vocational-Technical Schools
    A. History and development
    B. Organization and administration
    C. Major purposes and goals
    D. An evaluation of them

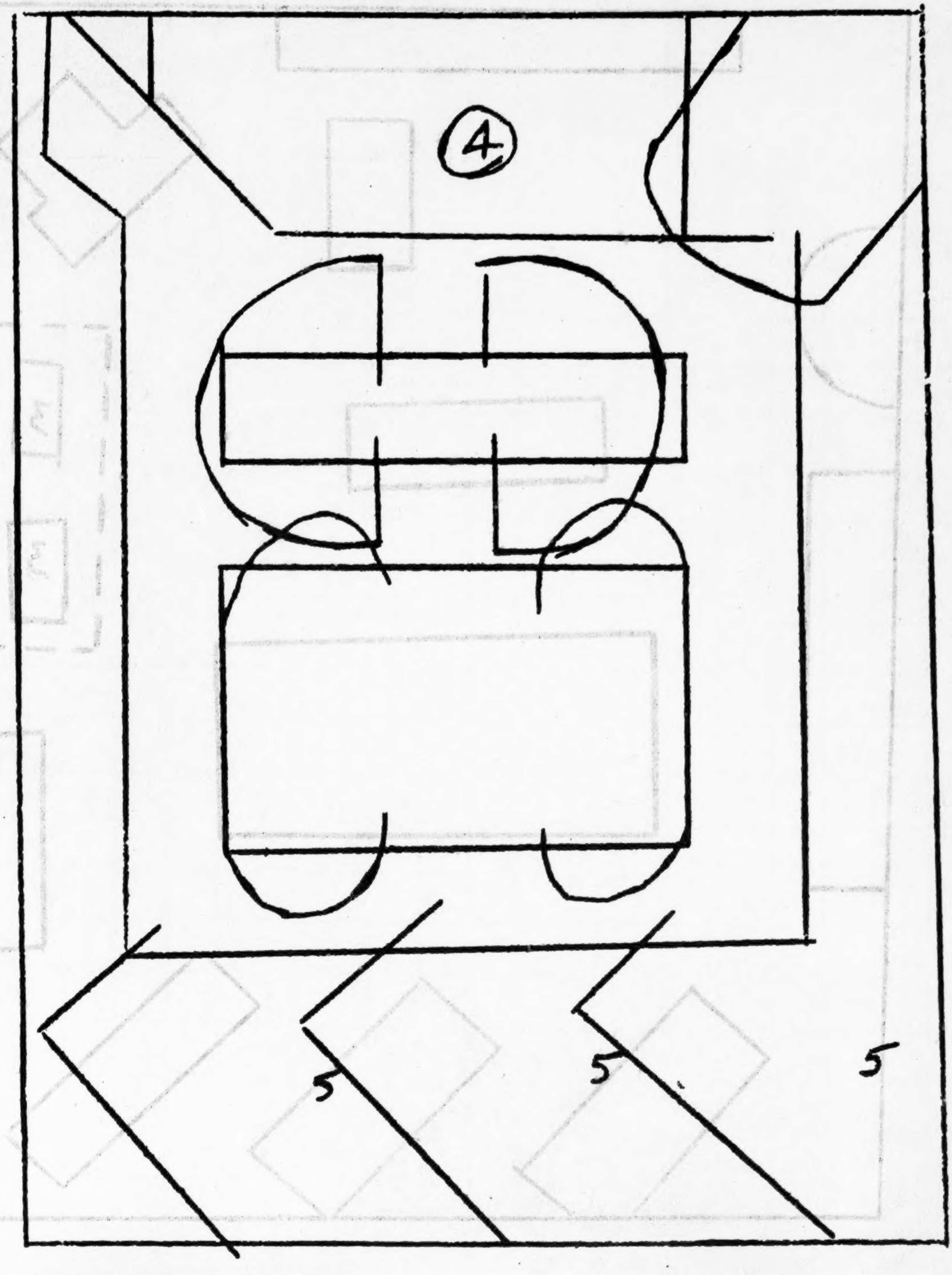
V. Visit to schools through selected color transparencies

UNIT	GRID SAMPLE FOR STUDENT EXCERCISE
11	MANAGING TEACHING-LEARNING FACILITIES

UNIT	PLAN FOR TEACHER OVERLAY
11	MANAGING TEACHING LEARNING FACILITIES



UNIT	PLAN FOR TEACHER OVERLAY
11	MANAGING TEACHING-LEARNING FACILITIES



UNIT 11	SOME FACTORS THAT DETERMINE THE LOCATION OF EQUIPMENT IN THE LABORATORY MANAGING TEACHING-LEARNING FACILITIES

1. Location of other classrooms regarding noise.
2. Availability of ventilation.
3. Locate so operators can be seen by instructors.
4. Location of stock room.
5. Access for clean up.
6. Nearness to tool room.
7. Weight of equipment.
8. How to move it to location.
9. The wiring facilities already present.
10. The future placement of other equipment.
11. Installation costs are important.
12. The number of sides of the equipment the worker normally needs access to.
13. Size of materials to be put through the machine.
14. The objectives of the facility.
15. Length of the material to be used on the machine.
16. Properly places so as not to obstruct emergency exits.
17. All safety principles can be carried out with adequate space.
18. Sequence in which equipment or work stations will be used.
19. Storage for attachments.
20. Floor construction (foundation).
21. Exhaust and dust removal system.
22. Sufficient artificial lighting.
23. Sufficient room to make repairs on machines.
24. Safety to operator and others in area.
25. Elimination of vibration.
26. Cost of moving or revising.
27. Materials location.
28. Supervision and discipline problems.
29. Noise factor.
30. Shape of room.
31. Dust-free area needed for some equipment.
32. Special cooling system.
33. Size of class.
34. Method of fastening machine to floor.

UNIT	TEACHER REFERENCES
II	MANAGING TEACHING-LEARNING FACILITIES

References:

A. **Modern School Shop Planning, Ann Arbor: Prakken Publications, Inc., 1965.**

B. **Nair, Ralph K. (ed.), Planning Industrial Arts Facilities, Bloomington, Ill.: McKnight & McKnight, 1959, (ACIATE 8th Yearbook).**

C. **Rockwell Manufacturing Co., School Shop Development, Rockwell Building, Pittsburgh, Pa.**

D. **Williams, William A. (ed.), Accident Prevention Manual for Shop Teachers, Chicago: American Technical Society, 1963.**

Unit 12

Planning Your Teaching Career

TEACHER'S GUIDE

FOR

VOCATIONAL-TECHNICAL TEACHING AS A CAREER

UNIT 12

FOR THE COURSE

INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING
(USOE Development Project OE6-85-051)

By the Staff
Department of Industrial Education
University of Minnesota

A series of twelve course units combining filmed presentations and seminar discussions designed to provide twenty-four clock hours of pre-service vocational teacher training

Vocational Section
Minnesota State Department of Education
Saint Paul, Minnesota 55101

UNIT 12	INTRODUCTION

This final Unit is concerned primarily with two major purposes: (1) the development of interest and motivation for further vocational teacher education and, (2) student and teacher assessment of their achievement through all Units of this course.

It is suggested that after viewing the Unit 12 film presentation, discussion be initiated around the teaching career aspirations of the participants. In particular, it is important for them to understand the necessity for in-depth, organized courses in the areas of philosophy of vocational education, analysis and course construction, methods of teaching, evaluation of teaching and laboratory lay-out and maintenance.

Since there will be a comprehensive final examination covering all twelve Units, about forty-five minutes should be reserved for this purpose.

UNIT 12 | OBJECTIVES

A student achieving the broad objectives for this course as clarified for this unit should:

(1) Understand the process of vocational teacher preparation common to the State of Minnesota.

(2) Understand and develop appreciations for the nature and comprehensiveness of the Area Vocational Schools in Minnesota.

The specific objectives (content) for attainment in this unit are:

STUDENTS WILL UNDERSTAND: cognitive principles, theories, concepts

1. Process of Vocational Teacher Preparation for this Course
    - A. Place of television in teacher preparation
    - B. Next steps in continuing vocational teacher preparation
    - C. Value of industrial institutes, seminars and workshops
    - D. Teacher Levels:
        - 1. Where operate
        - 2. Certification requirements

2. Area Vocational Schools
    - A. Comprehensiveness
    - B. Number and school locations
    - C. Local community commitment
    - D. Local community responsibility
    - E. Standards for administration and supervision of programs
    - F. Area School courses
    - G. Area School economic importance to community and the State

UNIT 12	LESSON MATERIALS

Some of the following teaching materials to help you with the teaching of this unit are included in the Resource Appendix for this unit. You will want to duplicate the necessary number of copies for class use. Other parts of these materials you will want to order sufficient copies from the Minnesota Vocational Education Division.

__Materials__

A. The thirty-minute film, __Vocational Teaching as a Career__

B. Script of Film, __Vocational Teaching as a Career__

C. Bulletin, __Minnesota's Area Vocational-Technical Schools__

D. Final Course Examination (Sample for Duplication)

E. Final Course Examination Answer Sheet

F. Final Examination Answer Key

G. Bulletin, __Minnesota State Plan for Vocational Education__

UNIT 12 SUGGESTED METHOD OF APPROACH*

DISCUSSION LEADER	STUDENT ACTIVITY
1. Initiate discussion with one or more questions covering Unit 12 video presentation or the content from previous units. Some blackboard or overhead questions: A. "What are some of the major things you have learned about vocational teaching?" B. "What more do you need to know to become an effective vocational teacher?" C. "What are you going to do next in further teacher education?"	1. Students formulate replies to these questions for chalkboard recording by the seminar leader.
2. Distribute Final Examination copies with answer sheets. Stress answers and all marking to appear on only the answer sheet.	2. Examination will usually require 45 minutes of student time.
3. Motivation will be high for student knowledge of their final examination score. If sufficient answer keys have been duplicated, students can score and post their own mark.	3. Pass around examination keys and progress chart for posting grades.
4. Group discussion of examination (If time permits)	

*The same approach can be used for one student or a group of students. While this approach is a suggested one, it is suggested also that the teacher for whom this content is new follow the procedure precisely. Successive teaching of the unit can depart from this procedure.

UNIT 12	**UNIT RESOURCE APPENDIX** **VOCATIONAL TEACHING AS A CAREER**

Resource Materials:

A. **Final Course Examination**

B. **Final Examination Answer Sheet (Sample for duplication)**

C. **Final Examination Answer Key**

D. **Film Script, Vocational-Technical Teaching As a Career**

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	FINAL COURSE EXAMINATION
12	INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING

Directions: This examination is designed to sample your achievement for all of the units of this course. Consider each test item in light of the total course. Select the one best alternative from among the four alternatives presented in each item. Darken in the slot on the separate answer sheet corresponding to the alternative you have selected. DO NOT MAKE ANY MARKS ON THIS TEST FORM.

1. An analysis of a trade or occupation will tell you:

    A. Almost all the things which might be taught about a trade or occupation
    B. The specific elements which should be stressed
    C. How to allocate your time in teaching
    D. What you need in new equipment with which to teach

2. Certification for vocational teaching comes under the:

    A. Vocational Division, State Department of Education
    B. State Department of Education, Certification Division
    C. University of Minnesota, Placement Division, Department of Industrial Education
    D. Vocational Certifications Department for Minnesota

3. The materials for any lesson plan comes directly from:

    A. The text book
    B. The analysis procedure
    C. The course of study
    D. The requirement evaluation

4. The preparation of vocational teachers like yourselves may be most effectively done by:

    A. Educational television
    B. Providing for small group, personal contact with instructor
    C. Combining these two
    D. Either one with no proof of which is best

5. Motor skill development in the trades or occupations:

    A. May be left to chance
    B. Generally develops quite naturally
    C. May be redirected by giving written instructions
    D. Must be supervised directly by the teacher

6. Breaking an operation into its operating steps is important for:

    A. Information topic planning
    B. Demonstrations of an operation
    C. Choosing a teaching method
    D. Clarifying technical information

UNIT 12	FINAL COURSE EXAMINATION
PAGE 2	INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING

7. One of the following is not included in the definition of an operation:

A. Small unit of work
B. Part of a job
C. Involves action steps
D. Contains information topics

8. The block base obtained during the analysis chart development is important for:

A. Teaching methods
B. Placing groups of operations in most desirable sequence
C. Specifying aims for a course or unit
D. Determining best order for jobs or projects

9. The two factors considered on a grid type analysis chart are:

A. Operations - jobs
B. Skills - information
C. Work habits - information
D. Job ease - difficulty

10. An instructional analysis used for developing a course of study is best described by the word:

A. Summary
B. Inventory
C. Outline
D. Syllabus

11. The instructional analysis is a most useful tool for:

A. Determining broad course objectives
B. Clarification of broad course objectives
C. Planning a lesson
D. Development of test instruments

12. Unit objectives differ from broad or general course objectives in that they:

A. Take into account the three kinds of learning behavior
B. Specify learning behavior in actual work element titles
C. Take less time to write
D. Are not as clearly defined

13. Course Units are:

A. Main course subdivisions
B. Lesson subdivisions
C. Subdivisions of the curriculum
D. The daily lessons as units

14. Broad course objectives for the kinds of courses planned for vocational and technical instruction usually:

A. Can be stated on one page
B. Are stated in terms of actual operations and information topics
C. Should be detailed enough for final examination development
D. Should evolve from unit objectives

15. Considering organized teaching plans in terms of the amount of content to be covered, the smallest unit is:

A. The course of instruction
B. The course unit
C. The unit lesson
D. The operation or procedure step

16. The teacher might have the students memorize terms as part of the:

A. Preparation stage
B. Presentation stage
C. Try-out stage
D. Follow-up stage

17. The teacher might tell the students about the variety of jobs in which measuring accurately with a micrometer is a necessity as part of the:

A. Preparation stage
B. Presentation stage
C. Try-out stage
D. Follow-up stage

18. The teacher might give a written test to students as part of the:

A. Preparation stage
B. Presentation stage
C. Try-out stage
D. Follow-up stage

19. The content for each lesson is selected:

A. After sequencing essential elements of content
B. Before sequencing essential elements of content
C. Before making the instructional analysis
D. After making the instructional analysis

20. A lesson contains:

A. 1/3 to 1/8 of the course content
B. Content for one class period
C. Content that can be learned effectively at one time
D. One essential element of content

21. Written assignment sheets do not:

A. Prepare students
B. Present the details of new content
C. Provide for try-out activities
D. Permit an opportunity for evaluation of learning

22. The discussion method is best used in the following situation:

A. Heterogeneous group, try-out stage
B. Heterogeneous group, presentation stage
C. Homogeneous group, try-out stage
D. Homogeneous group, presentation stage

23. The discussion method is used best during what stage of the lesson?

A. Preparation
B. Presentation
C. Tryout
D. Follow-up

24. A method that can be used for carrying students through all four stages of the lesson is called:

A. Illustrated lecture
B. Discussion
C. Oral questioning
D. Supervised study

25. The teacher gives a written test covering the content of a lesson which he has taught using an illustrated lecture and a discussion. He would normally expect the students to earn the following test scores:

A. All scores 100% correct
B. All scores 70% correct
C. Scores range from 0% to 100%
D. Scores range from 70% to 100%

26. The students should practice:

A. Immediately following the demonstration
B. After reviewing their related information notes
C. During the next class period
D. Whenever they have time

27. Which statement is most correct?

A. Different instructors teach the same operation differently
B. Operations to be taught can be identified best by college professors
C. Operations are relatively standard between craftsmen
D. Identifying operations is very difficult

UNIT 12	FINAL COURSE EXAMINATION
PAGE 5	INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING

28. Demonstration evaluation questions are asked by:

A. The students
B. The instructor
C. Both A and B
D. Written tests

29. The primary consideration in selecting a job for students to complete is that it:

A. Be typical of jobs performed in the occupation for which they are training
B. Contain those operations the instructor wishes to teach
C. Be simple
D. Repeat selected operations

30. Which of the following is not a consideration in selecting an "operation" to be taught?

A. Frequency of use in industry
B. Appeal to the students
C. The logical order of skill development
D. The maturity and dexterity of the students

31. Audio Visual aids best enhance the process of education by:

A. Providing experiences out of which generalizations are developed
B. Enabling teachers to become more specific in their teaching
C. Making pupils less verbally minded
D. Gradually replacing verbal symbols

32. The meaning of a word is most dependent on an individual's:

A. Experience
B. Verbal facility
C. Education
D. Knowledge of the dictionary definition

33. The felt or flannel board is intended primarily for:

A. Demonstration
B. Interpretation
C. Manipulation
D. Enlargement

34. Audio Visual Materials were defined as:

A. Films and film strips
B. Projected and nonprojected materials
C. Power tools for teachers
D. Mechanical devices used in teaching

35. In the selection of audio visual materials you should:

A. Use materials that may be available
B. Use materials that "fill" the class period
C. Always make your own
D. Be practical

36. For the preparation of your own photographic slides and copies you would find the __________ most valuable.

A. Polaroid camera
B. Single lens reflex camera
C. Stereo type slide camera
D. 8 mm stil camera

37. A transparency for the overhead of a graph in the evening paper would most likely be made:

A. By hand
B. By diazo process
C. By the pantograph
D. By the thermographic process

38. Where motion is essential but the relatively simple subject is not widely taught you would probably select:

A. 8mm
B. 16mm
C. 35mm
D. 70mm

39. The teacher wishes to personally add changes to the picture on the screen. He would probably use:

A. 16mm
B. Opaque
C. Overhead
D. Film strip

40. Where therewas little or no facility for room darkening, you would use:

A. The overhead projector
B. The opaque projector
C. The 8mm motion picture projector
D. The 2 x 2 slide projector

UNIT 12	FINAL COURSE EXAMINATION
PAGE 7	INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING

41. When we compare the judgement and measurement approaches to evaluation we realize that judgements can include many personal biases, emotions, etc.; therefore we should:

    A. Use judgemental results only for descriptive purposes
    B. Teach only those skills and kinds of information which can be measured
    C. Avoid judgemental processes whenever we must depend on the results
    D. Use measurement processes whenever the information needed lends itself to measurement

42. The teacher's competence in his occupational field would have the most bearing on which of the following characteristics of evaluation instruments?

    A. Validity
    B. Reliability
    C. Scoring consistency
    D. Adminstrative ease

43. A major problem and first concern in stating criteria for a particular evaluation task is:

    A. Making them understandable to the persons to be evaluated
    B. Finding good ways of measuring the criteria once they are selected
    C. Wording the criteria in ways which demand the most realistic and exact answers
    D. Deciding which criteria are most important for the task undertaken

44. If we compare the results of an evaluation based on measurement to those gotten from a judgemental evaluation, the results of measurement will:

    A. Give a clearer picture of the situation or condition evaluated
    B. Depend less on evaluator's technical competence
    C. Contain less evaluator's bias in scoring
    D. Be an exact description of the situation

45. A written test was prepared by instructor "a" and administered to his class. The students corrected their own tests and were allowed to keep their test papers. Which function of evaluation is most reasonably inferred from the instructor's conduct?

    A. Measure of student achievement
    B. Guide to planning instruction
    C. Student selection
    D. Teaching device

UNIT 12	FINAL COURSE EXAMINATION
PAGE 8	INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING

46. It was suggested that a 1-3 or 1-5 scale be used on rating sheets. Which of the following statements best justifies the point?

A. Scales with finer divisions make the rating sheets too large for 8½ x 11 paper
B. More precise discriminations, such as 1-10, are not expected to be necessary on the job
C. The attempt to make finer discriminations tends to result in less consistent rating
D. Students understand the scale better than some more complex system

47. The practice of basing evaluation of student achievement on observation of students at work is understood to be:

A. Good, because instructors know their own objectives and therefore know what to observe
B. Poor, because the time involved in observing and rating individual students is impractical
C. Good, because it makes a very direct and valid measurement of the student's ability to use and apply things taught
D. Poor, because the instructor can do no more than make subjective appraisals of students' ability and understandings

48. A major value to be derived from an evaluation schedule is that it:

A. Insures the validity and reliability of the evaluation technique used
B. Provides a testing calendar which allows the instructor to place his evaluations appropriately
C. Clarifies the variety of appropriate evaluation techniques and the areas in which they may best be used.
D. Guarantees the construction of comprehensive tests that cover the range of course content

49. In constructing a test blueprint, the instructor is concerned with:

A. Kinds of test items to be used
B. Levels of understanding to be evaluated
C. The reliability of the evaluative instrument to be used
D. None of the above

50. Which reason would be most important for including the "try-out" step in the list of steps for developing a performance test?

A. To make sure all equipment is working properly
B. To remove or correct ambiguous directions and requirements
C. To make sure the job isn't too difficult
D. To produce a model product against which to compare the student's work

51. Maintenance of equipment should be handled by:

A. Contracting with some outside agency
B. Assigning it to students as a learning activity
C. The instructor who assumes it as part of his teaching load
D. None of the above are sufficient

52. Where new facilities are being planned it was suggested that lighting and decoration problems be given due consideration by:

A. Assuming complete dependence on artificial lighting
B. Researching the available literature on lighting and painting
C. Developing a shop layout plan
D. Acquiring the services of a lighting and interior decoration consultant

53. The primary consideration in selecting a tool and accessory equipment storage system for a given facility is/are the:

A. System used by establishments which employ graduates of your program
B. Traffic patterns identified as normal during instruction
C. Instructional utility inherent in the storage systems under consideration
D. Cost and space required by the storage systems under consideration

54. Included among the sub-topics under the heading of "Layout" was/were:

A. Power outlets
B. Dead storage
C. Reference materials space
D. All of the above

55. Poor lighting in a work area can have negative effects on students':

A. Overall work habits
B. Safe working practices
C. Quality in performance
D. All of the above

56. The Area Vocational-Technical Schools:

A. Do not have clear-cut goals and objectives
B. Offer the same courses over and over, year after year
C. Offer some courses for college credit
D. Train people specifically for existing jobs
E. Have no responsibility for placing graduates

UNIT 12	FINAL COURSE EXAMINATION
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57. The Area Vocational-Technical Schools of Minnesota:

    A. Are public schools, owned and run by the local communities
    B. Are responsible to advisory committees
    C. Are subject to dominant supervision by the State Department
    D. Derive their support exclusively from Federal funds
    E. Offer programs specified by the Director

58. The final seventy-two clock hours of teacher training may be obtained:

    A. In many ways
    B. Through the State Colleges
    C. By correspondance
    D. By attendance in University courses
    E. Through the State Department

59. Clinics and Institutes, sponsored and run by industry and business, are taken:

    A. Any time during the teacher preparation
    B. Three or four years after starting in teaching
    C. For as much as sixty clock hours of credit
    D. When technical teaching content is fresh from work in industry
    E. As an alternative to work experience in business or industry

60. The content covered in the television session:

    A. Was provided by the Vocational Division
    B. Comes from many sources
    C. May be found in two major references
    D. Serves as sufficient preparation for permanent certification
    E. Has been shown to be of unquestionable value

Appendix B

Introduction to Vocational-Technical Teaching
Industrial Education Staff, University of Minnesota

UNIT	ANSWER SHEET - UNIT EXAMINATION
12	INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING

Name ______________________ Code No. ______________________

Date ______________________ Score ______________________

Discussion Leader ______________________

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D		A	B	C	D		A	B	C	D
1.	0	0	0	0	21.	0	0	0	0	41.	0	0	0	0
2.	0	0	0	0	22.	0	0	0	0	42.	0	0	0	0
3.	0	0	0	0	23.	0	0	0	0	43.	0	0	0	0
4.	0	0	0	0	24.	0	0	0	0	44.	0	0	0	0
5.	0	0	0	0	25.	0	0	0	0	45.	0	0	0	0
6.	0	0	0	0	26.	0	0	0	0	46.	0	0	0	0
7.	0	0	0	0	27.	0	0	0	0	47.	0	0	0	0
8.	0	0	0	0	28.	0	0	0	0	48.	0	0	0	0
9.	0	0	0	0	29.	0	0	0	0	49.	0	0	0	0
10.	0	0	0	0	30.	0	0	0	0	50.	0	0	0	0
11.	0	0	0	0	31.	0	0	0	0	51.	0	0	0	0
12.	0	0	0	0	32.	0	0	0	0	52.	0	0	0	0
13.	0	0	0	0	33.	0	0	0	0	53.	0	0	0	0
14.	0	0	0	0	34.	0	0	0	0	54.	0	0	0	0
15.	0	0	0	0	35.	0	0	0	0	55.	0	0	0	0
16.	0	0	0	0	36.	0	0	0	0	56.	0	0	0	0
17.	0	0	0	0	37.	0	0	0	0	57.	0	0	0	0
18.	0	0	0	0	38.	0	0	0	0	58.	0	0	0	0
19.	0	0	0	0	39.	0	0	0	0	59.	0	0	0	0
20.	0	0	0	0	40.	0	0	0	0	60.	0	0	0	0

DISCUSSION POINTS

Before you begin the examination or while you are waiting for others to finish the test, list below points not clear to you from the film. Clarification of these points will be your responsibility during the seminar discussion following the test.

UNIT	ANSWER KEY - UNIT EXAMINATION
12	INTRODUCTION TO VOCATIONAL-TECHNICAL TEACHING

Name
Date
Discussion Leader

ANSWERS

EXAMINATION ANSWERS
(Darken the appropriate circle)

	A	B	C	D		A	B	C	D		A	B	C	D
1.	●	○	○	○	21.	○	●	○	○	41.	○	●	○	○
2.	●	○	○	○	22.	○	●	○	○	42.	○	○	●	○
3.	○	○	●	○	23.	●	○	○	○	43.	○	○	●	○
4.	○	○	○	●	24.	●	○	○	○	44.	○	○	○	●
5.	○	○	○	●	25.	○	○	●	○	45.	○	○	○	●
6.	○	○	○	●	26.	○	○	○	●	46.	●	○	○	○
7.	●	○	○	○	27.	○	○	○	●	47.	○	○	●	○
8.	○	○	●	○	28.	○	○	●	○	48.	○	○	●	○
9.	○	○	●	○	29.	●	○	○	○	49.	○	●	○	○
10.	○	○	○	●	30.	○	○	○	●	50.	○	●	○	○
11.	○	●	○	○	31.	○	○	●	○	51.	●	○	○	○
12.	○	○	○	●	32.	●	○	○	○	52.	●	○	○	○
13.	○	●	○	○	33.	○	○	○	●	53.	●	○	○	○
14.	●	○	○	○	34.	●	○	○	○	54.	○	○	●	○
15.	○	●	○	○	35.	○	○	●	○	55.	○	○	○	●
16.	○	○	●	○	36.	○	○	○	●	56.	○	●	○	○
17.	○	○	●	○	37.	●	○	○	○	57.	○	○	○	●
18.	○	○	●	○	38.	○	○	○	●	58.	●	○	○	○
19.	○	●	○	○	39.	○	●	○	○	59.	○	○	●	○
20.	○	●	○	○	40.	○	●	○	○	60.	●	○	○	○

INSTRUCTOR NOTES

NOTE - This answer key should be punched on a few of the same answer sheets as you have duplicated for the students. In this way the keys will be in registration and can be accounted for and can be passed around for students to score their own final examination.

After you have used the test with fifty or more students, you can record the information and later determine a mean and standard deviation. In this way you can tell each student in more meaningful terms how well he has done.

FILM SCRIPT	DR. HOWARD F. NELSON
UNIT 12	VOCATIONAL-TECHNICAL TEACHING AS A CAREER

AUDIO	VIDEO
At the beginning of this series of lessons designed to prepare potential vocational instructors for starting positions in teaching, I gave the first presentation. Now we have come to the final session.	
All of us who have had a part in this work are deeply concerned that these lecture-demonstrations and seminars which have followed each lesson have been truly profitable to each of you - that they have begun to provide you with the first teaching tools which you are going to need as you enter upon a new and difficult vocation. Perhaps only time alone will give us the answer.	
In this twelfth session, I wish to do several specific things. There are a number of questions which have arisen during the seminar-discussions which need further clarification. For example, many of you have asked about books, references and resources dealing specifically with the content covered in these lessons. I have come prepared to satisfy this request.	
Almost every seminar leader has noted an inquiry from someone who has asked, what happens to us next? What's in the future for us? You should raise these kinds of questions and you ought to have a satisfying answer. I'll do my best to provide some enlightenment on this topic.	
In conjunction with this explanation, I want to give you some new information about how you may accumulate additional clock hours of credit toward the certificate. And, I would like to tell you about the different kinds of instructors who teach in the various vocational programs.	

FILM SCRIPT	VOCATIONAL-TECHNICAL TEACHING AS A CAREER
UNIT 12	PAGE 2

AUDIO	VIDEO
Many of you have expressed an interest in learning more about the Minnesota Area School system - where the schools are - how they are organized and run. When I expand on this topic, I wish to use a set of color transparencies showing shops, laboratories, classrooms and provisions actually taken in these Area Schools. Through the use of these shots, I can demonstrate not only the wide diversity of courses and programs, but I can also illustrate quite clearly, I believe, why industry and the local people of the community have every right to be intensely proud of their schools. Now, let's take these topics one at a time. What happens next to all of you? Having completed the first twenty-four clock hours of instruction at the conclusion of this session, you can qualify for a temporary certificate to teach in a vocational school course. Needless to say, this is the very minimum with which you should begin teaching. I must also make the fact very clear that you will not be given a certificate until you have been hired to teach. When you have the position, then you get the certificate. The important consideration is that you can qualify for certification right now. However, we consider these first twenty-four clock hours of instruction as constituting an overview of the teaching and learning process. If an additional series of the same length were planned, it would of necessity, get into much more depth in each of the major areas than has been the case so far. Since learning, for instructors as well as students, requires activity, this suggests that your next step involves work in formal, organized courses in which you learn to do what we have been talking about.	

AUDIO	VIDEO
You must remember, even in your own teaching that talking isn't teaching, and listening isn't necessarily learning. This is why I have said that learning requires activity -- activity on the part of the learner.	
From here on, you instructors should begin to attend regular, formal classes held on the University campus, either Duluth or Minneapolis, or attend classes offered through extension in your local community or at a nearby center. Each three-credit course counts for an additional thirty-six clock hours of credit toward the certificate. Naturally, you should take more than the minimum number of courses required.	CHART IND 100- INDUST. INSTRUCTION IND 101 - TESTS IN INDUS. SUBJ. IND 103- INSTRUCTIONAL AIDS IND 110- VOCATIONAL GUIDANCE IND 125 - PHIL. & PRACTICE OF I Ed IND 135- INSTRUCTIONAL MATERIALS LAB. 3 credits each. 36 clock hours each. toward certificate.
When conditions dictate, we sometimes provide no fee, no credit courses for vocational instructors. These, too, are always set up to carry clock hours of credit, and are often provided in your own school in response to a request from the local Director for this service.	
When these requirements were explained to members of one seminar, several participants raised questions about it. This is a good time to point out that all teachers must up-date themselves at regular intervals in order to meet local school board requirements. They do this through taking extension courses or they go to the University of College campusses to take courses in their teaching specialties. In this respect, vocational instructors are no different or are no exception to the rule.	
Now here is new information about how you can obtain credit for as much as seventy-two additional hours of credit toward certification. After you are hired for a position in teaching, you may attend technical institutes and workshops sponsored and conducted by business and industry. These are avail-	

AUDIO	VIDEO

able in almost every field. For example, if you were teaching auto-mechanics, you would find that the industry conducts institutes covering such problems as hydramatic transmissions, auto electric systems or braking systems.

Typically, instructors postpone taking these courses until after they have taught for a few years or until their technical know-how has become rusty or out-of-date. This is the appropriate time to obtain institute instruction.

By the way, these industrial institutes cannot be substituted for the present kind of instructor training. They are always in addition to the instruction which you have been getting through these lessons.

In the previous sessions, no one has explained about the different kinds of instructors who work in the vocational school programs. Let me expand on this right now because I'm sure you are interested in it.

First, there are teachers in the all-day program where students attend classes on much the same time schedule as the regular school follows. Then, there are instructors who teach in the evening extension courses; as the name suggests, these are classes conducted primarily in the evening for students who work during the day.

And there are instructors who teach part-time in special classes which are set up to meet a specific need. Part-time teachers may work for several weeks or months depending upon the needs of the group being served. They may not conduct another class for quite some time until called back by the school's Director.

Teachers in these last two categories

AUDIO	VIDEO
often retain their regular employment and then teach only when the need arises.	
In one of the seminars, someone asked about working even after taking a teaching position. Actually, employment in the industrial, technical, or occupational fields about which you are expected to teach while in the classroom is an important component of your teaching competence. I would suggest that you seize every opportunity to continue working in your special area in order to keep yourself well informed and up-to-date about it for teaching purposes.	
And finally, I would hope that there are several of you listening to this presentation who will decide to return to a campus to continue your education until you have completed your first degree. No doubt, some of you now have one or more years of college or university work finished. Why don't you finish what you started? Do you think you will be out of place? All alone? Different? Nonsense.	
Come to see me sometime and I'll introduce you to several students who have worked five, ten, or even fifteen years in the industry and have then decided to finish the degree. We're very proud of them and they are proud of themselves.	
Now let's turn to some of the books, references, and other resources which cover much of the content handled throughout the previous lessons. Don't try to take notes on this part because we will have a complete list of these materials at the seminars for distribution. As I deal with each item, I wish to comment about it.	
And now, I want to give you a little historical background about the Area Vocational-Technical Schools. These	

AUDIO

VIDEO

schools are our newest kind of public schools. They came into being about twenty years ago following the passage of enabling legislation which made them possible. They came into being in the traditional American manner. Local citizens recognized a need, they committed local financial resources and they petitioned for a license and support of educational authority.

Like all public schools, the Area Schools operate under standards set up by the State Board of Education. Supervision of them is vested in the Vocational Division of the State Department of Education.

The local directors of these schools work very closely with business, labor and industry in designing programs of instruction. Public spirited citizens serve on State and local advisory committees to help decide what skills, technologies and preparation is needed, and to what depth of training these courses should go.

Directors of schools are responsible to the superintendent of schools; the schools belong to the communities themselves. They build them and they run them.

The major goal of every school is to train students for specific payroll jobs that are here today and for those jobs which are coming tomorrow. Let me list the main areas of instruction -- agriculture, home economics, health, office practices, distributive, trade and industrial and technical areas.

These are important fields to the economy of this State. These are the fields in which a majority of our people work. The Area Schools train craftsmen and skilled technicians who

AUDIO	VIDEO
are employable in these major areas of employment. This is the mission of the Area Vocational-Technical Schools.	
And now, I have made provision to use some pictures, color transparencies taken in the schools to illustrate in part, the diversity and breadth of these programs.	SLIDES (ABOUT 30) REPRESENTATIVE AND COMPREHENSIVE SHOW: TRADE & INDUSTRIAL TECHNICAL HEALTH RELATED AGRICULTURE RELATED BUSINESS RELATED AND SELECTED ADDITIONAL SLIDES
This concludes the final session in the series of television lessons designed to give initial preparation for potential instructors for the vocational-technical school courses and programs.	
We believe that we have given you a sufficient over-view into the new vocation of teaching, but at the same time, we are certain that we have but scratched the surface so far as adequate coverage is concerned. We have given you the most elementary kit of teaching tools with which to begin.	
Good teaching is complex and demanding and it will take much work on your part. We hope that we may help you as you build your competence for teaching, and we hope that you will become one of the best.	